



**D SERIES CONTROLLER  
TROUBLESHOOTING AND  
COMPONENT REPLACEMENT  
MPVDCONTV113E-3**

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**REVISION HISTORY**

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-0	11/20/03	Initial PDF release, based on Rev.-0 of print copy	CB/CB
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**TROUBLESHOOTING**

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## **TROUBLESHOOTING**

### **1.0 TROUBLESHOOTING**

This unit provides error recovery flowcharts, error code information, and error code troubleshooting flow charts. In addition, typical causes and remedies for the errors are also provided.

#### **1.1 ERROR RECOVERY**

Figures 1-1 and 1-2 show troubleshooting processes that may be helpful if the controller becomes unresponsive to commands or an error code has been encountered that cannot be cleared. Troubleshooting should begin with confirmation of basic integrity of the system: ensure that the power supply is on and meeting supply requirements, all cables are correctly attached, all circuit boards are properly installed and fully seated, all peripheral equipment is wired correctly, software is properly configured, etc.

## TROUBLESHOOTING

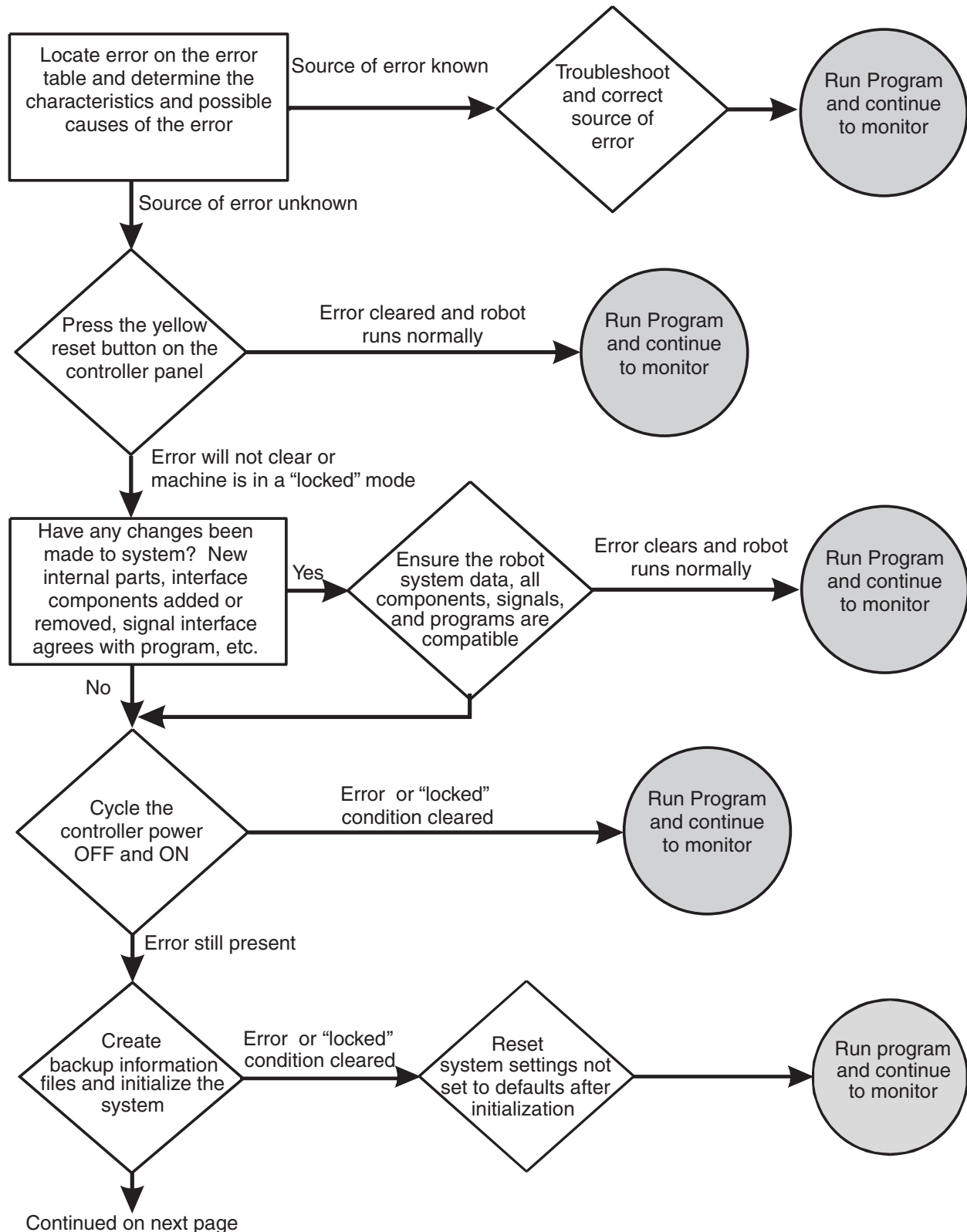


Figure 1-1 Troubleshooting Process

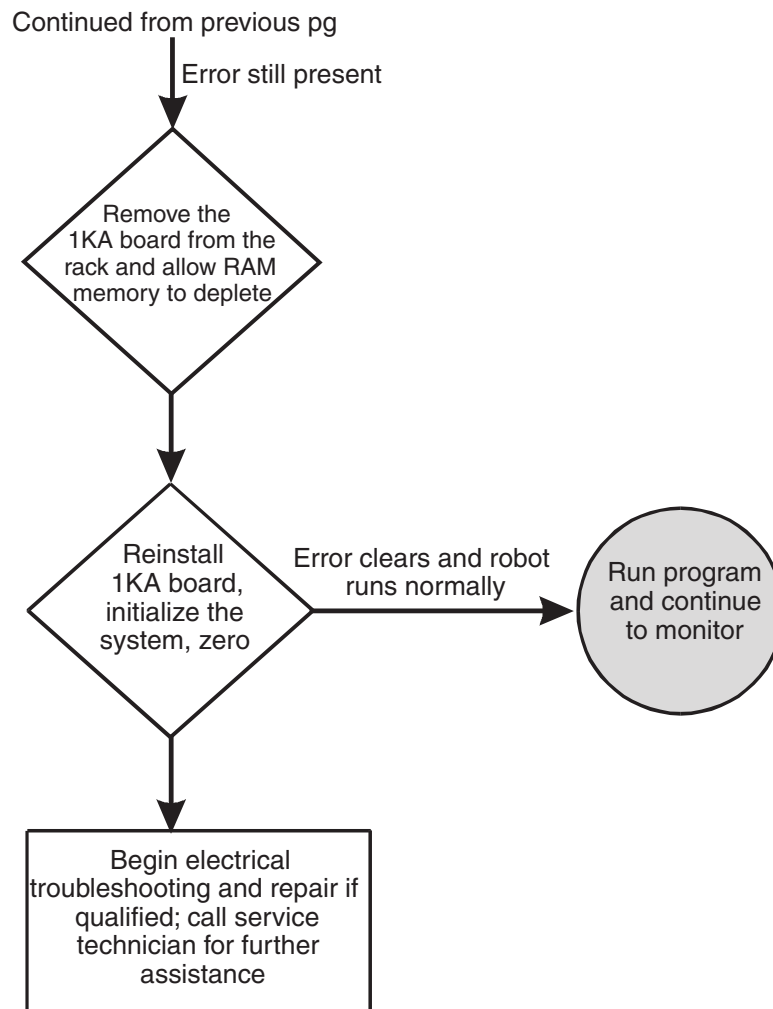
**TROUBLESHOOTING**

Figure 1-2 Troubleshooting Process (Continued)

## TROUBLESHOOTING

### 1.2 PRELIMINARY TROUBLESHOOTING

Prior to following error code troubleshooting procedures, ensure preliminary troubleshooting steps are completed.

1. Ensure proper 460 VAC three-phase power is available at the input and output side of the controller main disconnect (circuit breaker F1).
2. Ensure circuit breakers F2, F3, F4, and F5 are not tripped.
3. Ensure proper +5 VDC, +12 VDC, -12 VDC and +24 VDC are available from the AVR power supply.
4. Observe the state of LEDs and refer to the appropriate section of the *D Series Controller Electrical Maintenance Manual* for conditions indicated by the LEDs. If these conditions are not normal, correct the cause of abnormal LED indications.
5. Check for loose connection at circuits boards and cable connections.
6. Ensure all circuit boards are properly seated in the card rack (where applicable).
7. Ensure the F1 and F2 fuses on the 1KP board are not open.

#### 1.2.1 TROUBLESHOOTING COMMON FAILURES

This section describes some common failures, possible causes, and corrective actions.

1.2.1.1 Controller Power Cannot Be Set ON

1.2.1.2 Teach Pendant is Inoperable

1.2.1.3 Motor Power Cannot Be Set ON

1.2.1.4 Robot Does Not Move



## TROUBLESHOOTING

### 1.2.1.1 CONTROLLER POWER CANNOT BE SET TO ON

This failure occurs when the controller does not power-up when the controller main disconnect is set to ON.

Failure 1: When the controller main disconnect is set to ON, circuit breaker F1 is tripped immediately.

Main causes include:

1. The AC power line is short-circuited in the controller, and circuit breaker F1 detects overcurrent and is tripped.
2. Defective F1 circuit breaker.

⇒ *Interrupt the 460 VAC to the main disconnect (circuit breaker F1) set the controller main disconnect to ON. Using an ohm meter check for a short circuit between these points:*

*R and S, S and T, T and R, R and FG, S and FG, T and FG (FG=frame ground)*

*If a short circuit is detected replace components as necessary (wiring, transformer T1, circuit breaker F1, etc.).*

Failure 2: When the main disconnect is set to ON, the control power lamp does not illuminate (circuit breaker F1 does not trip).

This failure occurs when the controller does not activate properly because of an abnormality in the primary power supplied to the controller or in the power supply circuit in the controller.

Main causes include:

1. The primary power voltage supplied to the controller is not within specifications, the primary power cable is disconnected or damaged, or the primary power is not supplied.
2. Power is not supplied to the 1KQ/1NR board, or the 1KQ/1NR board is defective.
3. Power is not supplied to the AVR power supply.
4. Power is not supplied to the control power lamp due to a defective AVR power supply, 1KX/1NR board, 1LS/1NS board or control power lamp.
5. Disconnected or short-circuited wiring in the controller.

## TROUBLESHOOTING

- ⇒ *Ensure primary power supply is within specifications. Ensure primary power supply cable is properly connected and is not damaged.*
- ⇒ *Ensure connectors at the 1KQ/1NR board are properly installed and not damaged.*
- ⇒ *Ensure the 1KP board fuses F1 and F2 are not open.*
- ⇒ *Replace the 1KQ/1NR board.*
- ⇒ *Ensure the power supplied to the AVR power supply is within specifications. Ensure the power connector at the AVR power supply is properly connected and not damaged.*
- ⇒ *Ensure to output voltages from the AVR power supply are within specifications.*
- ⇒ *Ensure the control power lamp is properly installed and is not defective.*
- ⇒ *Repair or replace disconnected or short-circuited wiring in the controller.*

## TROUBLESHOOTING

### 1.2.1.2 TEACH PENDANT IS INOPERABLE

The teach pendant is in operable with the controller main disconnect set to ON and the control power lamp is illuminated.

Failure 1: The control power lamp is illuminated and the teach pendant is inoperable (the back light is not illuminated).

DC power is supplied to the controller, but power is not supplied to the teach pendant to illuminate the display or back light.

Main causes include:

1. +12 VDC is not supplied to the teach pendant.
2. Defective LCD panel, circuit board, or other internal teach pendant components.
3. Disconnected or short-circuited teach pendant cable.

⇒ *Ensure the teach pendant cable is properly connected to the controller.*

⇒ *Replace the teach pendant.*

⇒ *Replace the teach pendant cable.*

Failure 2: The back light is illuminated, but the screen is not displayed.

When the teach pendant back light is illuminated this indicates power is supplied to the teach pendant. If the teach pendant is operating normally the initial screen is displayed regardless of the 1KA board condition.

Main causes include:

1. Defective LCD panel, circuit board, or other internal teach pendant components.

⇒ *Replace the teach pendant.*

Failure 3: The teach pendant screen is displayed and the back light is illuminated, but key input and AS Language commands are not possible.

This condition occurs when key input and AS Language commands do not reach the 1KA board or data from the 1KA board does not reach the teach pendant.

Data is transmitted between the 1KA board and the teach pendant as shown in figure 1-3.

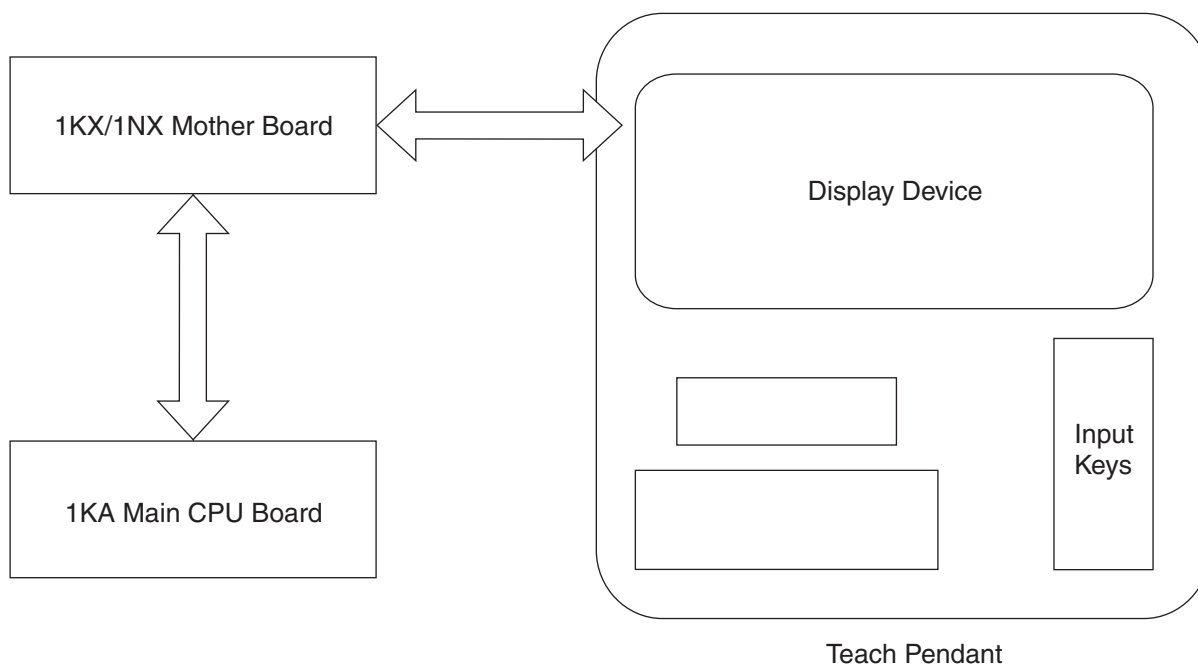
**TROUBLESHOOTING**

Figure 1-3 1KA/Teach Pendant Communication

Main causes include:

1. Interruption in data communication between the teach pendant and the 1KA board.
2. Defective LCD panel, circuit board, or other internal teach pendant components.
3. Defective 1KA or 1KX/1NX boards.
4. Disconnected or short-circuited teach pendant cable.

⇒ *Ensure the teach pendant cable is properly connected to the controller.*

⇒ *Replace the teach pendant cable.*

⇒ *Replace the teach pendant.*

⇒ *Replace the 1KA or 1KX/1NX boards.*

## TROUBLESHOOTING

### 1.2.1.3 MOTOR POWER CANNOT BE ENABLED

This condition exists when motor power does not engage when the MOTOR POWER switch is pressed.

Main causes include:

1. An error condition exists.
2. K1, K2, or K3 are not engaged due to a defective 1KQ/1NR board, MC unit, teach pendant, software, external signals etc.
3. Emergency stop condition exists.
4. Defective power block.
5. Disconnected or short-circuited motor power supply harness.
6. Motor temperature or controller internal temperature exceeds limits

⇒ *If the operation panel error lamp is illuminated or an error message is displayed on the teach pendant LCD, take appropriate measures to release the error condition according to the error message.*

⇒ *Check and repair any abnormalities in the motor power supply circuit.*

⇒ *Ensure all EMERGENCY STOP switches are released.*

⇒ *Replace the power block.*

⇒ *Replace the motor power supply harness.*

⇒ *Ensure motor temperature and controller internal temperature does not exceed limits.*

## TROUBLESHOOTING

### 1.2.1.4 ROBOT DOES NOT MOVE

This condition exists when the robot does not move when conditions are set for teach or repeat mode.

Main causes include:

1. External hold condition exists.
2. An error condition exists.
3. Operation panel switches set incorrectly.
4. Motor brakes are not released.
5. If the check mode is selected, ensure an enabling device is engaged and the GO (step forward) key is pressed.
6. Robot is waiting for input signals in repeat mode (cycle start, step forward, program change, WX, JUMP, etc.)

⇒ Release external hold condition.

⇒ If the operation panel error lamp is illuminated or an error message is displayed on the teach pendant LCD, take appropriate measures to release the error condition according to the error message.

⇒ Ensure the operation panel switches are set correctly for robot operation.

⇒ Ensure proper brake voltage is available to the brake release circuit. Check and repair poor connections, disconnected connectors, open wiring, short circuited wiring, or any abnormalities in the brake circuits. Ensure the 1KP board, 1KQ/1NR board, AVR power supply, MC unit, 1KQ/1NR board, servo motor, and controller internal brake harnesses are in serviceable condition.

⇒ When check mode is selected, ensure an enabling device is engaged and the GO (step forward) key is pressed.

⇒ In repeat mode, ensure input signals are received to release a wait condition.



## WARNING

The robot may move suddenly when a wait condition is released. Do not approach the robot when it appears to be stopped.

## TROUBLESHOOTING

### 1.3 ERROR CODES

This unit provides information about the error codes that are displayed on the teach pendant or other user interfaces that provide display screen information. The error codes are listed in numerical order by prefix and code number with the message that is displayed on the teach pendant. An expanded explanation of the message is provided along with possible methods to clear or prevent the specific error. Troubleshooting information is preceded by an  $\Rightarrow$  symbol.

Table 1-1 provides an explanation of the error code prefixes.

Table 1-1 Error Code Prefix Descriptions

Error Log Code	Description	Comment
D	Fatal error	Hardware, software, or peripheral device error. When error is corrected control power must be cycled OFF and ON.
E	Non-fatal error	When error is corrected, press error reset.
P	Operation error	Does not affect robot motion.
W	Mechanical/control warning	May cause an error if not corrected.

Table 1-2 describes the controller state for each type of error.

Table 1-2 Controller Error State

Error Type	Error Lamp	Cycle Start Lamp	Motor Power
P	OFF	ON	ON
W	<sup>1</sup> ON or OFF	<sup>1</sup> ON or OFF	<sup>1</sup> ON or OFF
E	ON	OFF	<sup>1</sup> ON or OFF
D	ON	OFF	OFF

<sup>1</sup>Depending on the error content

## TROUBLESHOOTING

### 1.3.1 ERROR DISPLAY

Error messages are displayed on the teach pendant LCD screen and/or a PC interfaced with the controller using KRterm/KCWIN32 terminal software.

The teach pendant LCD screen displays operation errors (P errors) in the system message area and other error messages are shown in a pop-up screen display (Figure 1-4).

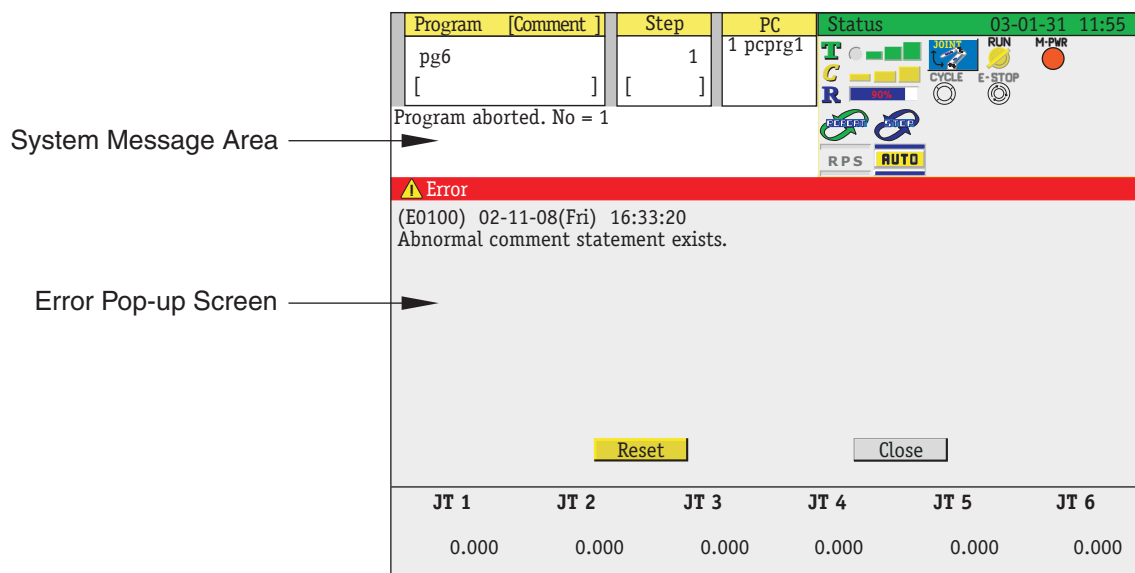


Figure 1-4 Teach Pendant Error Screen Display

### 1.3.2 ERROR LIST

Refer to the following sections for errors and descriptions:

1.3.2.1 DXXXX Fatal Error Codes

1.3.2.2 EXXXX Non-Fatal Error Codes

1.3.2.3 PXXXX Operation Error Codes

1.3.2.4 WXXXX Mechanical/Control Warning Error Codes



## TROUBLESHOOTING

### 1.3.2.1 DXXXX FATAL ERROR CODES

#### ERROR CODE D0001 CPU Error. (PC=XX)

The 1KA board CPU has stopped (detected by the AS software). This error is caused by defective AS or servo software, defective hardware, or noise related malfunction.

PC Error Display Example:

Error (D0001) CPU error Code=1

---

---

Task (Pc01) Stop SIG=00070004 [FAULT (PARALLEL)] PC=\*\*\*\*\*

---

---

↑  
Indicates the place the error occurred

- ⇒ Refer to the error message displayed on a PC interfaced with the controller.
  - ⇒ Cycle controller power OFF and ON. Do not initialize the controller. If a message for initialization is displayed, select "NO".
  - ⇒ If the error does not reset when power is cycled, initialize the system and reload program data.
  - ⇒ Replace the 1KA board.
  - ⇒ If the above steps do not correct the error, contact KRI customer service.
- 

#### ERROR CODE D0002 Main CPU BUS error. (PC=XX)

A 1KA board bus error occurs (in the VME bus line, detected by AS software); data processing is not completed normally. This error is caused by defective AS software, defective 1KA board, or noise related malfunction.

PC Error Display Example:

Error (D0002) CPU BUS error Code=1

---

---

Task (Pc01) Stop SIG=00070004 [NMI(VME BUS ERROR)] PC=\*\*\*\*\*

---

---

↑  
Indicates the place the error occurred

- ⇒ Refer to the error message displayed on a PC interfaced with the controller.
  - ⇒ Cycle controller power OFF and ON. Do not initialize the controller. If a message for initialization is displayed, select "NO".
  - ⇒ If the error does not reset when power is cycled, initialize the system and reload program data.
  - ⇒ Replace the 1KA board.
  - ⇒ If the above steps do not correct the error, contact KRI customer service.
-

## TROUBLESHOOTING

### ERROR CODE D0003 VME BUS error. (PC=XX)

This error occurs when the CPU does not receive a response from one of the I/O bus devices within a specific time. This error is caused by defective AS software, defective 1KA board, or noise related malfunction.

PC Error Display Example:

Error (D0003) VME bus error Code=1

---

---

Task (Pc01) Stop SIG=00070004 [NMI(VME BUS ERROR)] PC=\*\*\*\*\*  
bus-read=\*\*\*\*\* bus-write=\*\*\*\*\*

---

---

Indicates the place the error occurred

- ⇒ Refer to the error message displayed on a PC interfaced with the controller.
- ⇒ Cycle controller power OFF and ON. Do not initialize the controller. If a message for initialization is displayed, select "NO".
- ⇒ If the error does not reset when power is cycled, initialize the system and reload program data.
- ⇒ Replace the 1KA board.
- ⇒ If the above steps do not correct the error, contact KRI customer service.

---

### ERROR CODE D0004 [ARM CONTROL BOARD] CPU error. (PC=XX)

The 1KB board CPU is stopped (detected by the AS software). This error is caused by defective AS or servo software, defective hardware, or noise related malfunction.

PC Error Display Example:

Error (D0004) [ARM CONTROL BOARD] CPU error Code=1

---

---

Task (Pc01) Stop SIG=00070004 [FAULT (PARALLEL)] PC=\*\*\*\*\*

---

---

Indicates the place the error occurred

- ⇒ Refer to the error message displayed on a PC interfaced with the controller.
- ⇒ Cycle controller power OFF and ON. Do not initialize the controller. If a message for initialization is displayed, select "NO".
- ⇒ Ensure the correct 1KB board software is loaded into the 1KA board.
- ⇒ Replace the 1KB board.
- ⇒ If the above steps do not correct the error, contact KRI customer service.

## TROUBLESHOOTING

### ERROR CODE D0005 [ARM CONTROL BOARD] CPU BUS error. (PC=XX)

On the 1KB board, a bus error occurs (in the VME bus line, detected by AS software); data processing is not completed normally. This error is caused by defective AS software, defective 1KB board, or noise related malfunction.

PC Error Display Example:

Error (D0005) [ARM CONTROL BOARD] CPU BUS error Code=1

---

Task (Pc01) Stop SIG=00070004 [NMI(VME BUS ERROR)] PC=\*\*\*\*\*

---

↑  
Indicates the place the error occurred

- ⇒ Refer to the error message displayed on a PC interfaced with the controller.
  - ⇒ Cycle controller power OFF and ON. Do not initialize the controller. If a message for initialization is displayed, select "NO".
  - ⇒ Ensure the correct 1KB board software is loaded into the 1KA board.
  - ⇒ Replace the 1KB board.
  - ⇒ If the above steps do not correct the error, contact KRI customer service.
- 

### ERROR CODE D0900 Teach data is broken.

The program storage area of the system memory is damaged and is not linking data correctly.

Main causes include:

1. Loss of memory battery back-up.
2. Noise related malfunction.
3. Defective 1KA board.

- ⇒ Set the 1KA board switch SW2-8 to ON and initialize the memory, do not use AUX 0805 or SYSINIT command. Reload the robot program data.
  - ⇒ Check the memory backup battery. Replace if necessary (3.3 VDC or less). When battery voltage drops to 3.3 VDC, or less, error W1010 is displayed.
  - ⇒ Replace the 1KA board if the error recurs.
-

## TROUBLESHOOTING

### **ERROR CODE D0901** AS Flash memory sum check error.

A check sum error occurs in AS software, in flash memory on the 1KA board, when the controller is powered-up. The check sum data is created when the FCHK command is executed and is recorded in flash memory during AS software download.

Main causes include:

1. When the AS software is downloaded, the FCHK command is not executed.
2. The addressing of the FCHK command is wrong.
3. The flash memory and 1KA board are defective.
4. The system data in the flash memory is corrupt.

⇒ *Confirm the content of the command as\_load.cmd file on the PC card. If error occurs immediately after downloading the AS software, download AS software again. If error continues after download, replace the 1KA board.*

---

### **ERROR CODE D0902** Servo flash memory sum check error.

A check sum error of the servo software in flash memory on the 1KA board occurs when the controller is powered-up. The check sum data is created when the FCHK command is executed and is recorded in flash memory during software download.

Main causes include:

1. When the servo software is downloaded, the FCHK command is not executed.
2. The addressing of the FCHK command is wrong.
3. The flash memory and 1KA board are defective.
4. The system data in flash memory is corrupt.

⇒ *If the error occurs immediately after servo software download, confirm the content of sv\_load.cmd on the PC card and download servo software again. If the error reoccurs, replace the 1KA board.*

---

### **ERROR CODE D0903** IP board memory error. (Code)

This error occurs when the flash ROM on the 1GS board is corrupt (check sum error).

Code 2: flash ROM SAM error.

Code 3: DPRAM write and read error.

Code 4: SRAM write and read error.

⇒ *Replace the 1GS board.*

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## TROUBLESHOOTING

**ERROR CODE D0904** Memory is locked due to AC\_FAIL.

The memory is accessed during the controller shut down due to a power supply abnormality (ACFAIL) (AVR +5 V, +12 V, -12 V, +24 V).

⇒ *Cycle the controller power OFF and ON.*

⇒ *Check for proper AVR voltage supply (+5 V, +12 V, -12 V, +24 V) and related circuitry.*

---

**ERROR CODE D1000** Read error of servo control software.

Main causes include:

1. Servo control software (armsc.mb) not found at controller power-up or software is corrupt.
2. Defective 1KJ/1QJ board.

⇒ *Download servo control software (armsc.mb).*

⇒ *Replace 1KJ/1QJ board.*

---

**ERROR CODE D1001** Download error of servo control software.

Servo control software (armsc.mb) download failure at controller power-up.

Main causes include:

1. Incorrect servo control software.
2. Defective 1KJ/1QJ board.
2. Defective 1KA and or 1KB board.

⇒ *Ensure the correct servo software is loaded into the 1KA board.*

⇒ *Replace the 1KJ/1QJ board.*

⇒ *Replace the 1KA and or 1KB board.*

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## TROUBLESHOOTING

**ERROR CODE D1002** Init. error of servo software.

Servo software (*armsc.mb*) initialization failure at controller power-up.

Main causes include:

1. Servo software is not installed correctly or is corrupt.
2. Incompatibility between the AS and servo software.
3. Defective 1KA and or 1KB board.

⇒ *Reinstall servo software.*

⇒ *Check compatibility of AS and servo software and reinstall software as needed.*

⇒ *Replace the 1KA and or 1KB boards.*

---

**ERROR CODE D1003** Init. error of servo control software.

Servo software (*armsv.abs*) initialization failure at controller power-up.

Main causes include:

1. Servo software is not installed correctly or is corrupt.
2. Incompatibility between the AS and servo software.
3. Defective 1KA and or 1KB board.

⇒ *Reinstall servo software.*

⇒ *Check compatibility of AS and servo software and reinstall software as needed.*

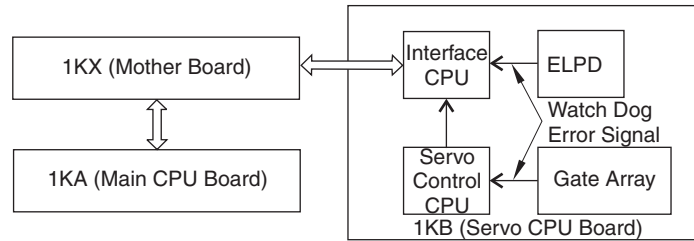
⇒ *Replace the 1KA and or 1KB boards.*

---

**TROUBLESHOOTING**

**ERROR CODE D1004** [ARM CTRL BOARD] watch dog error of servo control software.

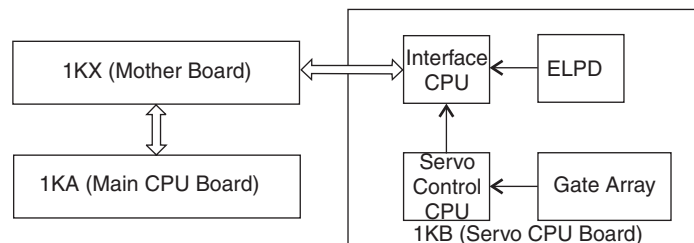
The watch dog circuit on the 1KA board or 1KB board has detected a software problem. This is caused by a defective 1KA main CPU board or 1KB servo CPU board or a problem with the servo software.



⇒ Replace the AS or servo software.  
⇒ Replace the 1KA or 1KB board.

**ERROR CODE D1005** Servo board command error. (xx)

Servo software returned an error code, other than a servo system error, to the AS software after receiving an unrecognized command from the 1KA board.



Main causes include:

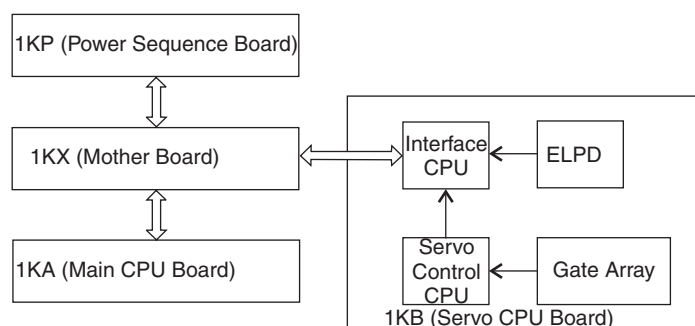
1. Corrupt servo or AS software.
2. Noise malfunction.
3. Defective 1KB servo board or 1KA main CPU board.
4. Versions of servo and AS software incompatible.

⇒ Install correct versions of servo and AS software.  
⇒ Replace the 1KA or 1KB board.

**TROUBLESHOOTING****ERROR CODE D1006**      AMP power unit error.

General servo system error. This error indicates that a servo system error has occurred. Refer to any other servo system errors which occurred at the same time.

When a servo error signal (SVER) is sent from the 1KB board (servo CPU board) to the 1KP board (power sequence board) motor power is shut down. The error notification is sent to the AS software via the EPLD. The error information from the 1KB board is sent through the command line and the corresponding error code(s) is/are displayed after D1006.



⇒ Check the servo error codes that follow this error for additional information. Ensure that the 1KP board and 1KB board are properly seated.

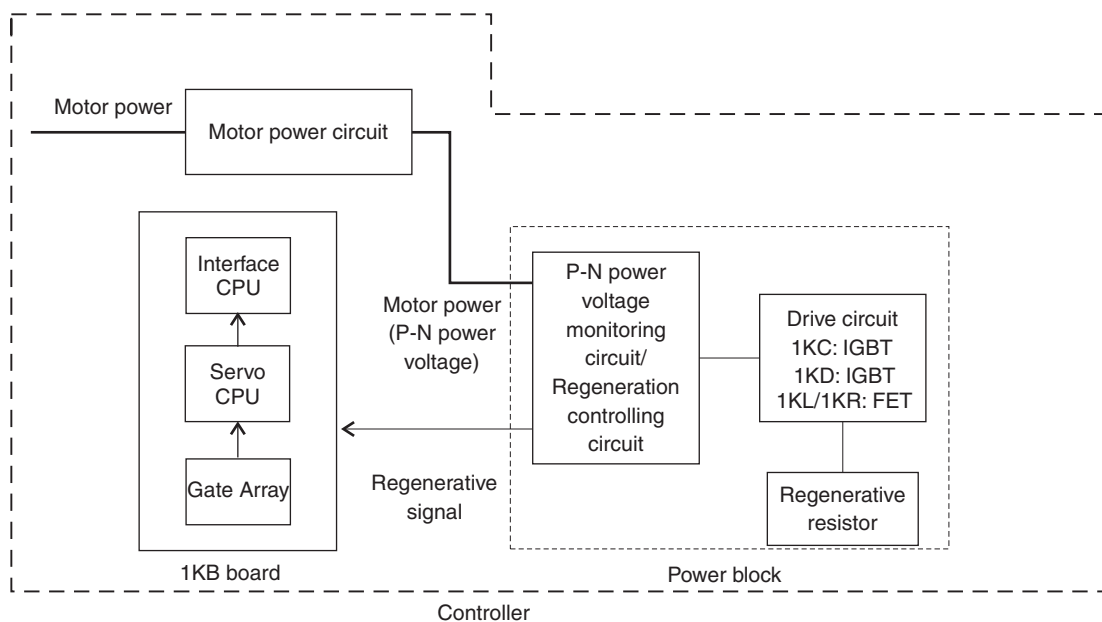


## TROUBLESHOOTING

### ERROR CODE D1007 Regenerative time over [XX].

This error occurs when current is sent to regenerative resistors for six or more consecutive seconds.

When the robot decelerates, the motors enter the power generation state to absorb the inertia energy from the arm. When the P-N power voltage exceeds the rated value (390 VDC), the current is split from the power block to the regenerative resistor. When the voltage drops to a safe level (365 VDC) the resistor is removed from the circuit.



Main causes include:

1. Abrupt direction changes at high speed.
2. Burned out regenerative resistors in the power block.
3. Defective power block.
4. Defective servo board (1KB board).
5. Loose or disconnected harness between 1KX board (mother board) connector X211 or X212 and the 1KB board (servo CPU board) connector X501 or X502.
6. Defective/incorrect optional second regenerative resistance unit (when used).

⇒ Avoid abrupt high speed direction changes. Change accuracy, speed, add points.

⇒ Replace defective regenerative resistor.

⇒ Install/replace optional second regenerative resistance unit.

⇒ Replace defective 1KB board.

⇒ Replace defective power block.

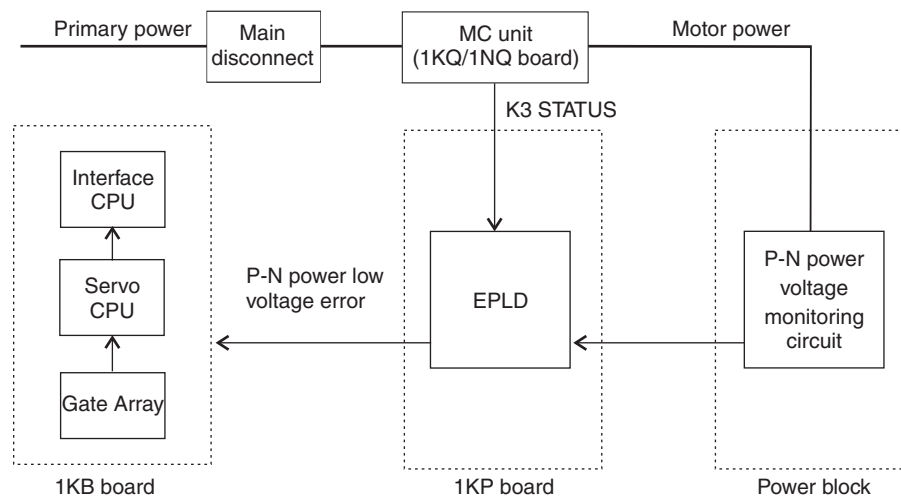
⇒ Check connections described in item 5 and repair as necessary.

**TROUBLESHOOTING****ERROR CODE D1008** P-N low voltage [XX].

The voltage between P-N supplied to the power block is 60 VDC or less at servo on.

**WARNING**

Because motor power is not supplied, when low voltage occurs, the arm will fall until the error is detected. As a result, other errors may be generated (abnormal speed, deviation error, etc.).



Main causes include:

1. Motor power circuit connector detached or loose.
2. Three phase (U, V, W) control power circuit breaker set to OFF.
3. Defective 1KB/1KP/1KQ/1NQ boards.
4. Defective power block.
5. Defective MC unit or harness.

⇒ Ensure the motor power circuit connector is properly attached.

⇒ Ensure control power circuit breaker is set to ON.

⇒ Replace the 1KB/1KP/1KQ /1NQ boards.

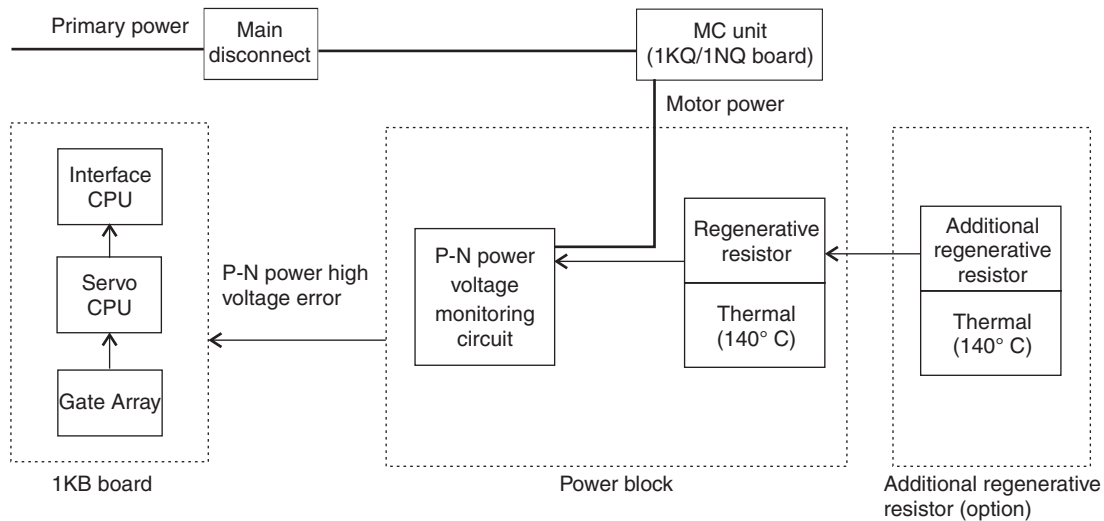
⇒ Replace the power block.

⇒ Replace the MC unit or harness.

## TROUBLESHOOTING

### ERROR CODE D1009 P-N- high voltage [XX].

The voltage between P-N supplied to the power block exceeded 410 VDC.



Main causes include:

1. High inertia loads due to excessive tool weight or incorrect program data.
2. Defective regenerative resistance control circuit, overheat failure of regenerative resistance unit, defective voltage monitoring circuit, or defective power block.
3. Defective servo board (1KB board) or harness.
4. Defective additional regenerative resistance unit.

⇒ *Reteach program steps to eliminate sudden high speed direction changes (dynamic shock).*

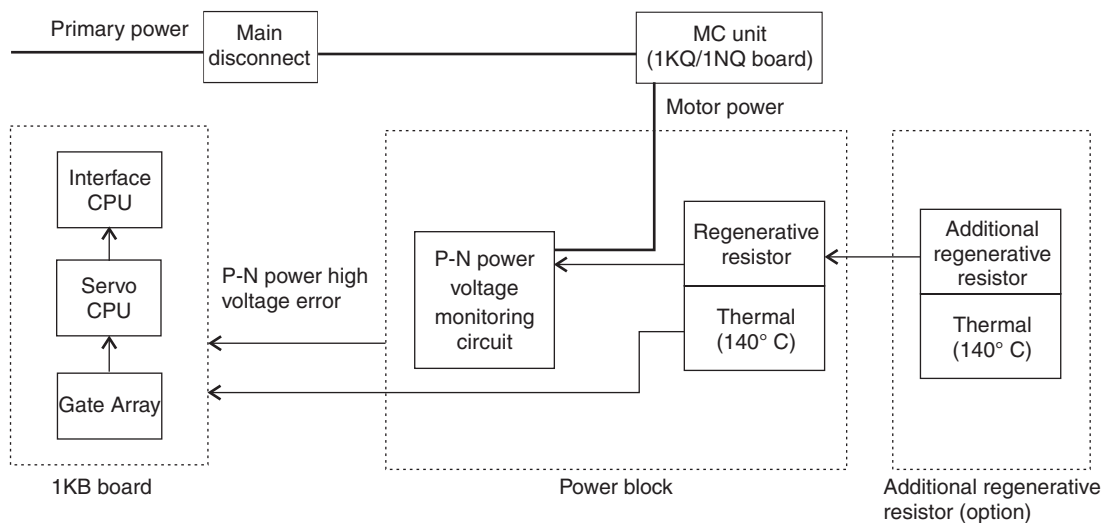
⇒ *Replace the regenerative unit.*

⇒ *Replace the 1KB board, power block or harness.*

⇒ *Replace the additional regenerative resistor unit.*

**TROUBLESHOOTING****ERROR CODE D1010** Regenerative resistor over-heat [XX].

The thermal switch for the power block regenerative resistor unit, or the optional regenerative resistor unit reached 140° C (284°F), or the heat sink thermal switch reached 90° C (194°F), or the controller cabinet thermal switch reached 70° C (158° F). The thermal switches are wired in series and the AS software cannot distinguish which thermal switch is activated. For D7X controller, if the heat exchange fan is inoperative (X207 disconnected) this error is generated.



Main causes include:

1. High inertia loads due to excessive tool weight or incorrect program data.
2. Defective cooling fans.
3. Insufficient clearance for air circulation.
4. High ambient controller temperature.
5. Defective power block.
6. Disconnected or defective harness between the 1KC/1KD board and the additional regenerative resistor unit.
7. Defective regenerative resistor unit.
8. Defective additional regenerative resistor unit.
9. Defective 1KB board.
10. Disconnected or defective harness between X211 or X212 on the 1KX/1NX board and X501 or X502 on the power block.

---

## TROUBLESHOOTING

- ⇒ *Reteach program steps to eliminate sudden high speed direction changes (dynamic shock).*
  - ⇒ *Ensure cooling fans are in proper working condition.*
  - ⇒ *Reduce controller ambient temperature.*
  - ⇒ *Replace defective thermal switch(es).*
  - ⇒ *Repair or replace disconnected or defective harness(es).*
  - ⇒ *Replace the regenerative unit.*
  - ⇒ *Replace the 1KB board, power block or harness.*
  - ⇒ *Replace the additional regenerative resistor unit.*
  - ⇒ *Connect or repair D7X power supply connection for heat exchange fan (X207).*
- 

**ERROR CODE D1011** AS or servo software is not compatible with the robot model.

This error occurs when the servo software does not match the robot specifications.

- ⇒ *Load the correct AS and servo software.*
- 

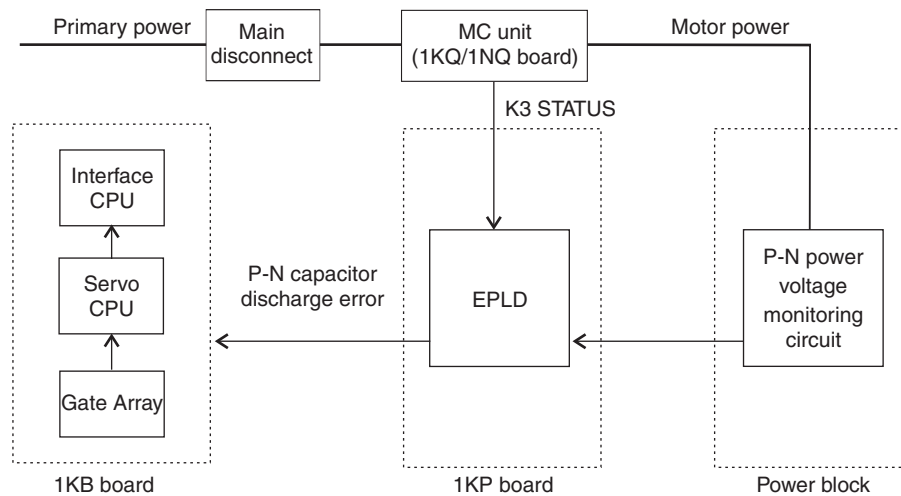
**ERROR CODE D1012** Servo type mismatch. Check the settings.

Servo type set for the robot and servo software do not match.

- ⇒ *Change the robot servo type setting.*
  - ⇒ *Install servo software that matches the robot setting.*
-

**TROUBLESHOOTING****ERROR CODE D1013** P-N capacitor is not discharged.

This error occurs when motor power is OFF for a period of time and the P-N power voltage does not decrease to 60 VDC or less.



Main causes include:

1. Defective 1KB/1KP/1KQ/1NQ boards.
2. Defective power block.
3. Defective MC unit or harness between the MC unit and the power block.

⇒ Replace the 1KB/1KP/1KQ/1NQ boards.

⇒ Replace the power block.

⇒ Replace the MC unit or harness between the MC unit and the power block.

**ERROR CODE D1014** Servo system error. (Code=XX)

An unrecognized error occurred in the 1KB board.

⇒ Contact KRI customer service (include operating conditions/settings at the time the error occurred).

**ERROR CODE D1015** The servo data file does not exist.

This error occurs when the servo data file is not found.

⇒ Contact KRI customer service (include operating conditions/settings at the time the error occurred).

## TROUBLESHOOTING

**ERROR CODE D1016**      Data applicable to the robot model not in servo servo data file.

This error occurs when the installed robot model file is not found in the servo data file.

⇒ *Contact KRI customer service (include operating conditions/settings at the time the error occurred).*

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**ERROR CODE D1017**      Error of download of servo data.

Servo data could not be downloaded from the servo software at controller power-up.

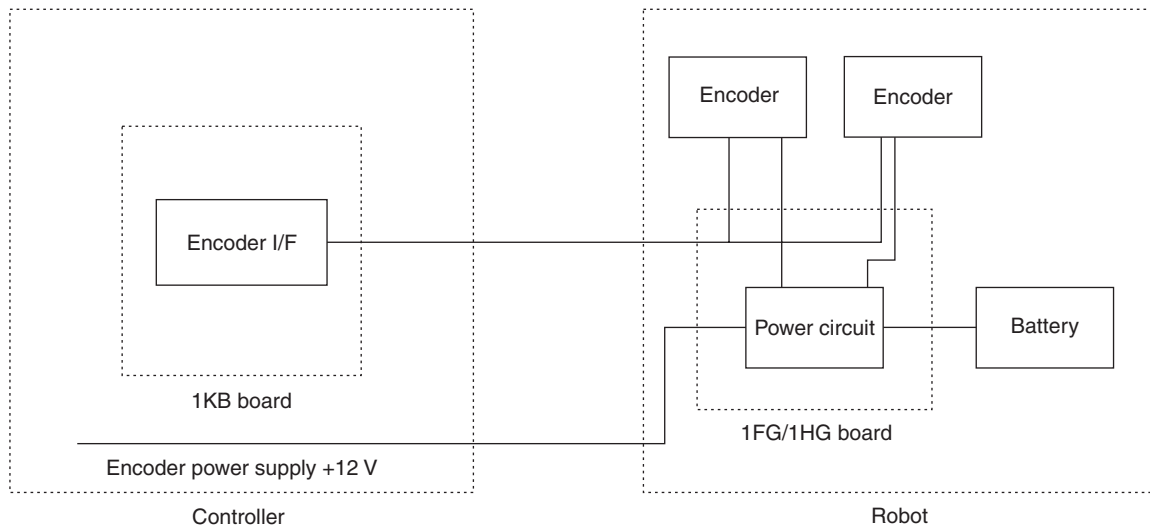
⇒ *Ensure the correct servo software is installed.*

⇒ *Ensure the 1KA and 1KB boards are properly installed.*

---

**TROUBLESHOOTING****ERROR CODE D1500** Encoder misread error JtXX.

Immediately after control power on, steady encoder data is not able to be read. This error is caused by a disconnected encoder signal line or a short circuit, or a defect in the main body of the encoder.



Main causes include:

1. Defective encoder or encoder harness.
2. Defective servo weld gun encoder (detected at controller power-up/power-down with gun connected).
3. Servo weld gun is not connected.
4. Defective 1KB board.
5. Defective 1FG/1HG board.

⇒ Check for disconnection or short circuit in encoder signal line.

⇒ Replace the encoder or encoder harness.

⇒ Replace the 1KB servo board.

⇒ Replace the 1FG/1HG board.

⇒ Release the servo weld gun axis in teach mode and cycle controller power OFF and ON.



**TROUBLESHOOTING**

**ERROR CODE D1501** Defective gun changer connection or encoder comm. error.

This error occurs when the servo weld gun is connected and encoder data is not read normally within the specified time.

Main causes include:

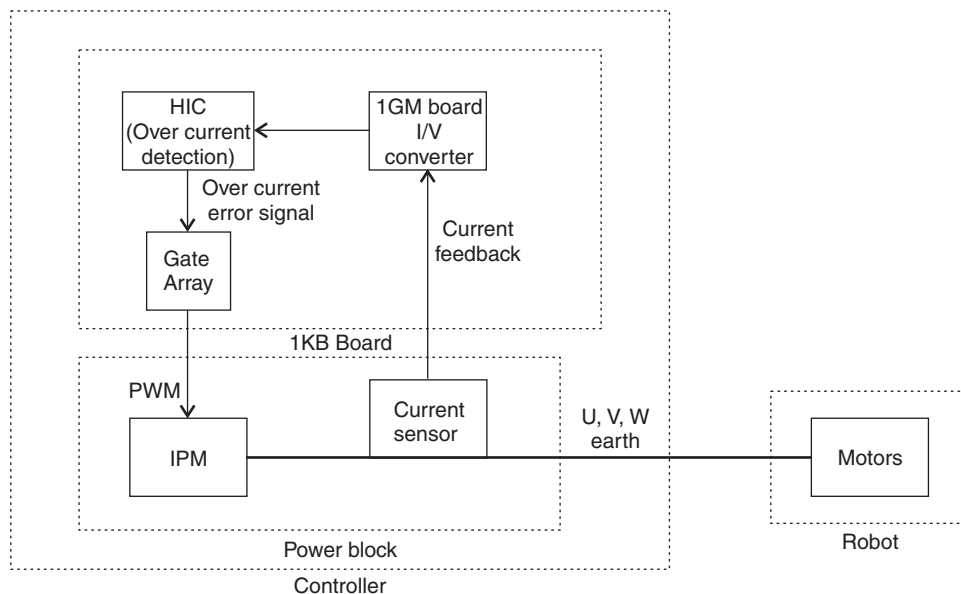
1. Improper connection at the tool changer.
2. Defective encoder or encoder communication line.

⇒ Check tool changer connection and repair as necessary.

⇒ Check encoder and encoder harness and replace as necessary.

**ERROR CODE D1502** Amp over current JtXX.

The feedback current from a current sensor in the power block exceeded 150% of the maximum instantaneous motor current rating.



Main causes include:

1. Short in the U, V, W from the power block to motor and ground wire.
2. Defective motor.
3. Defective power block.
4. Defective 1KB servo board, harness, etc.

⇒ Check the connection for the U, V, W and ground line to the power block. Replace the separation harness if necessary.

⇒ Replace the motor, 1KB board, power block, or harness.

## TROUBLESHOOTING

### ERROR CODE D1503 Current detector type (XX) mismatch!

When the control power supply is turned ON, the ID code data of the 1GM (1KV) board and the AS software installed on the 1KB board do not correspond. The unit name of the servo board displayed at (XX) in the error message corresponds to the CH column in the table below.

CH	To Communication	Relay to Power Sequence Board (1KP PC Board)
A	First 1KB PC Board A Unit	Master
B	First 1KB PC Board B Unit	Master
C	First 1KB PC Board C Unit	Slave
	or	
	Second 1KB PC Board A Unit	
	or	
D	One Axis Amplifier	Slave
	Second 1KB PC Board B Unit	
	or	
	One Axis Amplifier	

Main causes include:

1. 1GM (1KV) board is not suitable for the AS software (robot model).
2. The AS software does not correspond to the 1GM (1KV) board.

⇒ *Ensure the correct AS software is loaded.*

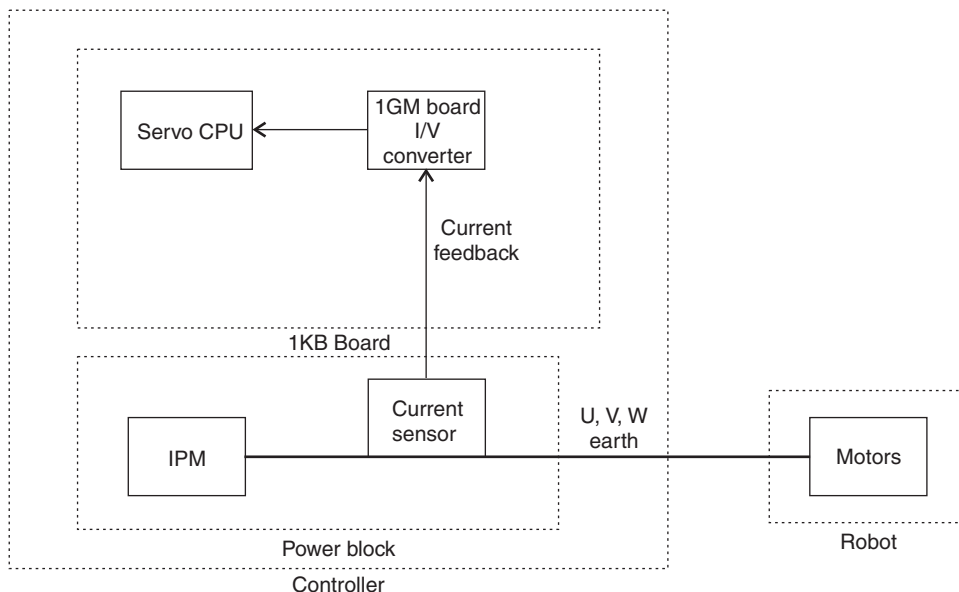
⇒ *Replace the 1GM (1KV) board.*

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**TROUBLESHOOTING**

**ERROR CODE D1504** Abn. curr. feedback Jt XX. (Amp fail, pwr harness disconnect).

This error occurs if the current feedback value is near 0 from the time the servo is turned ON until the brake is released, even if the commanded current value meets or exceeds the expected current.



Main causes:

1. Motor power line U, V, and/or W phase are disconnected.
2. Improper power harness line connection.
3. Defective power block

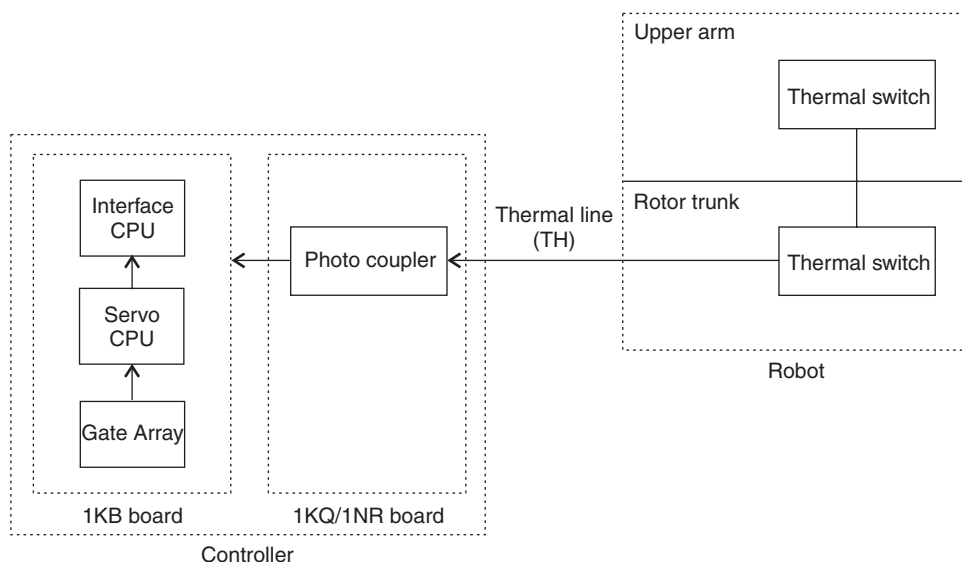
⇒ Check the power line wiring and repair or replace as necessary.

⇒ Replace the power block.

## TROUBLESHOOTING

### ERROR CODE D1505 Motor harness disconnected or over heat. (XX)

Motor thermal circuit is open due to motor overheat or harness problem. Not all robot models utilize thermal switches in the motors. Some robot models may have multiple thermal switches connected in series (see diagram below). The FS03/06/10/20 robot models have the thermal switch mounted near JT1 motor. The FS03 model is calibrated to 55° C and FS06/10/20 models are calibrated to 65° C



Main causes include:

1. Disconnected thermal line.
2. Defective connection in the separation harness.
3. Defective 1KB servo board.
4. Defective 1KQ/1NR board.
5. When the motor thermal switch is used:
  - The robot rated weight capacity is exceeded.
  - The ambient temperature exceeds limits for use.
  - Excessive execution of abrupt high speed direction changes.
  - Defective controller cooling fan or cooling air purge system.
  - Servo system holding the robot arm in high load position for extended periods.
  - Defective thermal switch.

⇒ When the thermal switch opens, error cannot be reset until cooling is complete.

⇒ Confirm continuity of thermal line.

⇒ Replace the harness or the 1KB servo board as necessary.

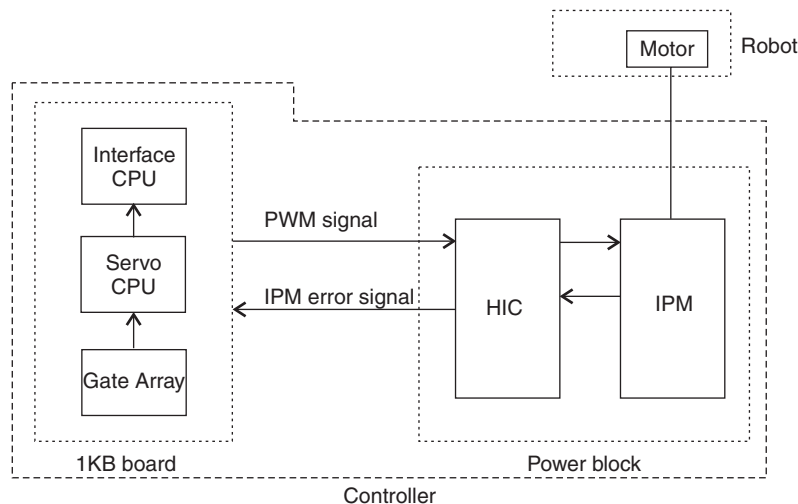
⇒ Replace the 1KQ/1NR board.

⇒ Use the auto servo off function, AUX 0808, to prevent the servo system holding a high load arm position for extended periods.

## TROUBLESHOOTING

**ERROR CODE D1506** Power module error JtXX.

An error signal from the IPM module in the power block is detected by the 1KB board.



Main causes include:

1. U, V, and W phase short-circuited or short-circuited to ground wire.
2. Payload weight exceeds rating.
3. Defective cooling fan in the power block.
4. Ambient temperature above normal operating limits.
5. Constant execution of abrupt high speed direction changes.
6. Defective 1KB board.
7. Disconnected or defective harness between the 1KB board and the power block.
8. Disconnection or poor connection in the thermal line at the separate harness and/or controller harness.
9. Defective thermal switch in the controller or servo motors (if used).
10. Defective power block.

⇒ Check and repair cause of U, V, and W phase short-circuited or short-circuited to ground wire.

⇒ Ensure payload does not exceed rating.

⇒ Reduce ambient temperature.

⇒ Ensure cooling fans are in proper working condition.

⇒ Correct abrupt high speed direction changes in the robot program.

⇒ Replace the 1KB board.

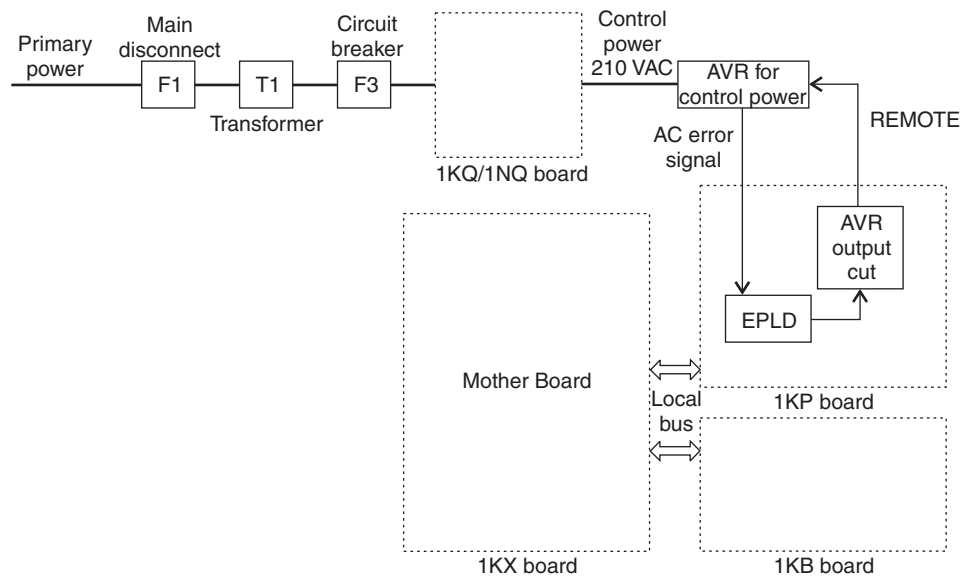
⇒ Repair or replace the harness between the 1KB board and the power block.

⇒ Check the thermal line in the separate harness and controller harness, and repair or replace as necessary.

⇒ Replace the power block.

**TROUBLESHOOTING****ERROR CODE D1507** AC primary power OFF.

This error occurs when there is an instantaneous decrease in the primary power to the AVR for control power supply (130–145 VAC or less for 20–30 msec).



Main causes include:

1. The primary power is below the specified rating, or an instantaneous power decrease occurred.
2. The non-fuseable breaker (NFB) F1 for the control power supply is turned OFF or tripped due to a short-circuit.
3. An instantaneous decrease in the 210 VAC supply to AVR for the control power supply.
4. Circuit breaker F3 is OFF or tripped due to a short circuit.
5. Defective AVR.
6. Defect in the primary power supply.
7. Defective 1KP board.
8. Defective 1KQ/1NQ board.

⇒ It is normal for this error to occur when NFB F1 is set OFF and back ON.

⇒ Check power supply circuit through NFB F1 and repair as necessary.

⇒ Check power supply circuit to the AVR through the circuit breaker F3 and repair as necessary.

⇒ Confirm that primary power is supplied according to specifications.

⇒ Replace the 1KP board.

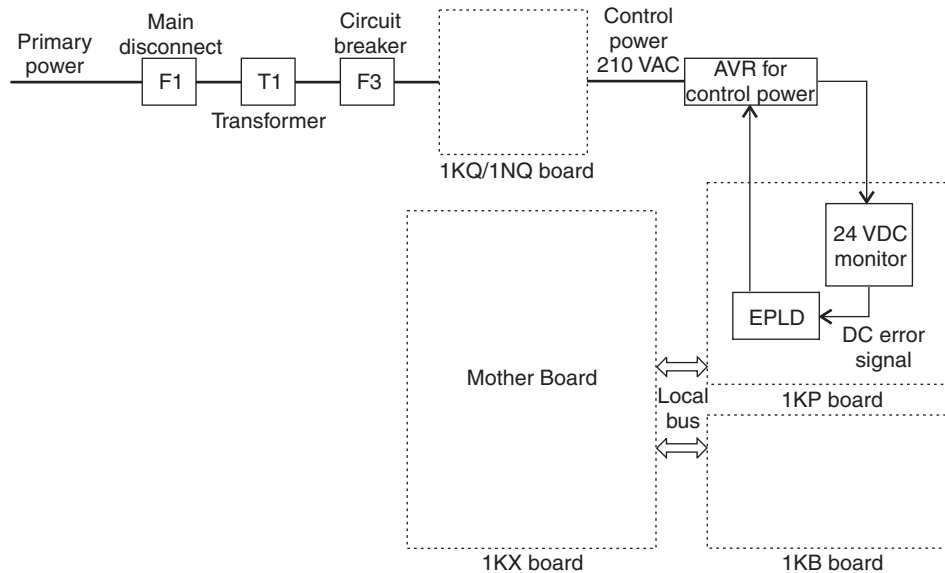
⇒ Replace the 1KQ/1NQ board.

⇒ Replace the AVR.

**TROUBLESHOOTING**

**ERROR CODE D1508** 24VDC power source is too low.

24 VDC to the power sequence board has dropped to +21.6 VDC or less.



Main causes include:

1. Defective AVR for control power supply.
2. Defective 1KP board.
3. Defective 1KQ/1NQ board.
4. Short circuit in the motor power on circuitry, the EMERGENCY STOP switch, or axis restriction limit switch circuits.
5. Short in machine valve and sensor circuits.

⇒ Check the power supply, machine valve, and the sensor circuits for short circuits.

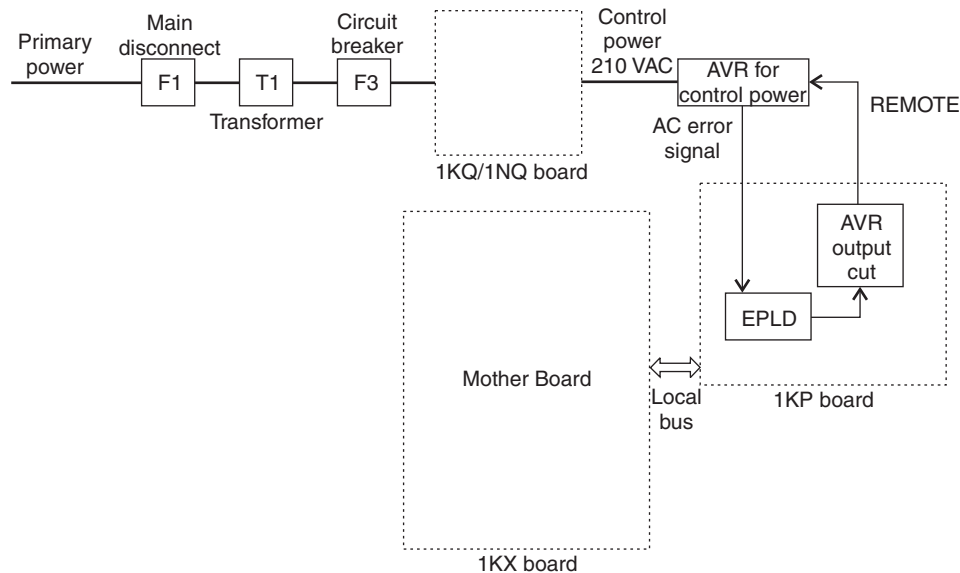
⇒ Ensure the 24 VDC load does not exceed the power supply capacity.

⇒ Check the AVR, the 1KP power sequence board, and the 1KQ/1NQ relay board and replace as necessary.

**TROUBLESHOOTING**

**ERROR CODE D1509** Primary power source is too high.

Voltage level of the AVR for the control power supply is too high (267-277 VAC or more for 1-2 sec.).



Main causes include:

1. Primary power exceeds the specified rating.
2. Defective AVR.
3. Defective 1KP power sequence board.
4. Defective 1KQ/1NQ relay board.
5. Power supply circuit problem.

⇒ *Ensure the power supply to the controller is within ratings.*

⇒ *Check power supply circuit to the AVR.*

⇒ *Confirm the supply power is within specifications.*

⇒ *Replace the 1KP board.*

⇒ *Replace the 1KQ/1NQ board.*

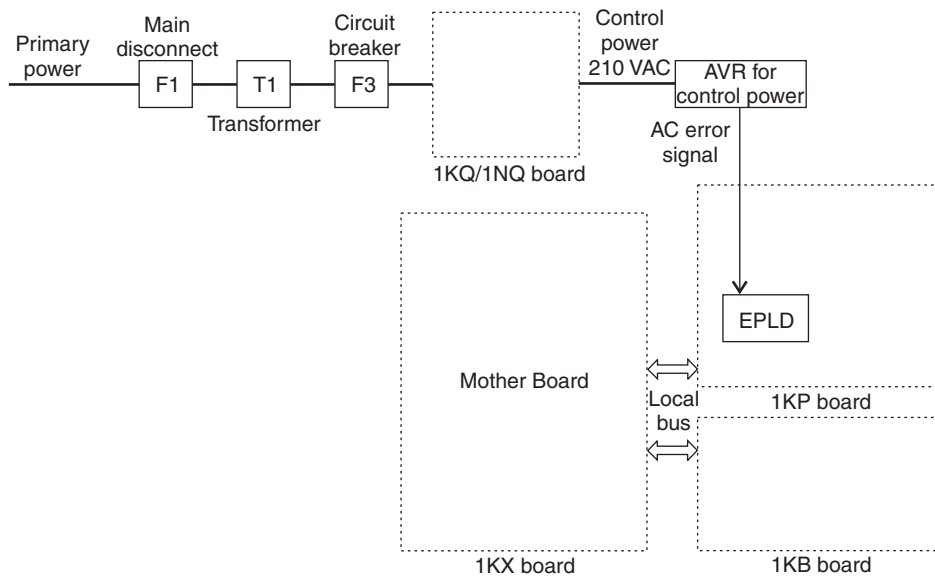
⇒ *Replace the AVR.*



**TROUBLESHOOTING**

**ERROR CODE D1510** Primary power source is too low.

Voltage level of the AVR primary power supply is too low (150-158 VAC or less for 1-2 sec.).



Main causes include:

1. Drop in the primary power supply voltage.
2. Defective AVR.
3. Defective NFB F1.
4. Defective 1KP power sequence board.
5. Defective 1KQ/1NQ relay board.
6. Power supply circuit problem.

- ⇒ Verify the power supply to the controller is within ratings.
- ⇒ Check the AVR and NFB F1 and replace as necessary.
- ⇒ Confirm supply power is within specifications.
- ⇒ Replace the 1KP board.
- ⇒ Replace the 1KQ/1NQ board.

## TROUBLESHOOTING

**ERROR CODE D1511**      +12VDC or -12VDC is abnormal.

+/-12 VDC supplied to the 1KA board is out of specifications.

+12 VDC: +10.75 VDC or less.

-12 VDC: -10.4 VDC or more.

Main causes include:

1. Defective AVR.
2. Defective 1KA, 1KB, or 1KP board.
3. Power supply contacts in the motherboard are damaged.
5. Defective power block.
6. Defective 1FG/1HG board.
7. Short in the harness between the servo unit and the 1FG board.
8. Short in the optional circuit boards, i.e., vision, etc.
9. Insufficient DC power supply capacity to support optional boards.

⇒ *Adjust the AVR output voltage.*

⇒ *Replace the AVR and each board for the control power supply.*

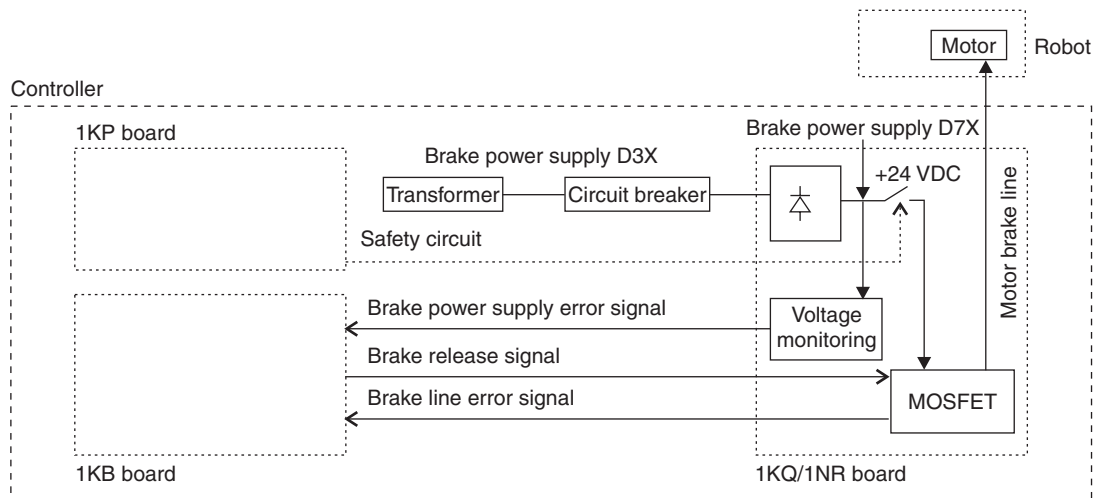
⇒ *Check for short circuits in the operation panel and separation harness and replace as necessary.*

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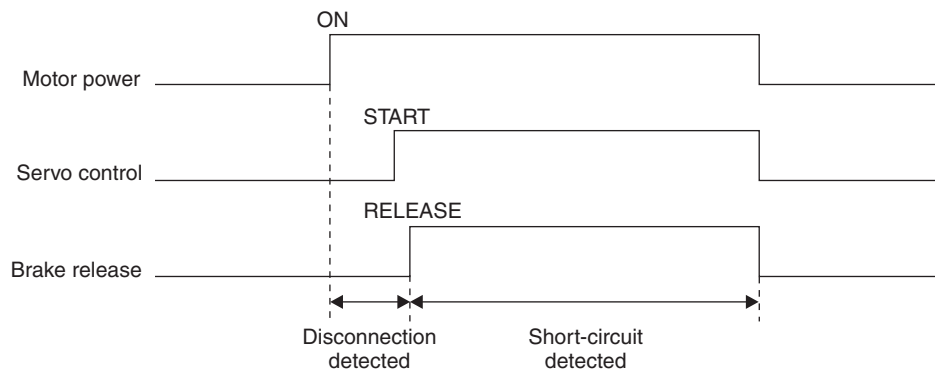
## TROUBLESHOOTING

### ERROR CODE D1512 Brake line error for JtXX.

This error occurs when the 1KB board detects an error signal sent from the brake release control MOSFET on the 1KQ/1NR board.



Brake line errors are not detected during motor power OFF. Brake line disconnection is not detected during automatic operation. Brake line error detection timing is shown in the diagram below.



Main causes include:

1. Disconnection/short-circuit/ground fault/poor connection at the brake line axis motor harness.
2. Defective connection for the brake power line.
3. Defective connection or harness between the 1KB and 1KQ/1NR boards.
4. Defective connection or harness between the 1KB and 1KX/1NX boards.
5. Defective connection or harness between the 1NR and 1NX boards.
6. Incorrect 1KP board safety circuit setting.
7. Defective 1KB or 1KQ/1NR board.

⇒ Check for disconnection or short-circuit in the motor harness, and repair or replace as

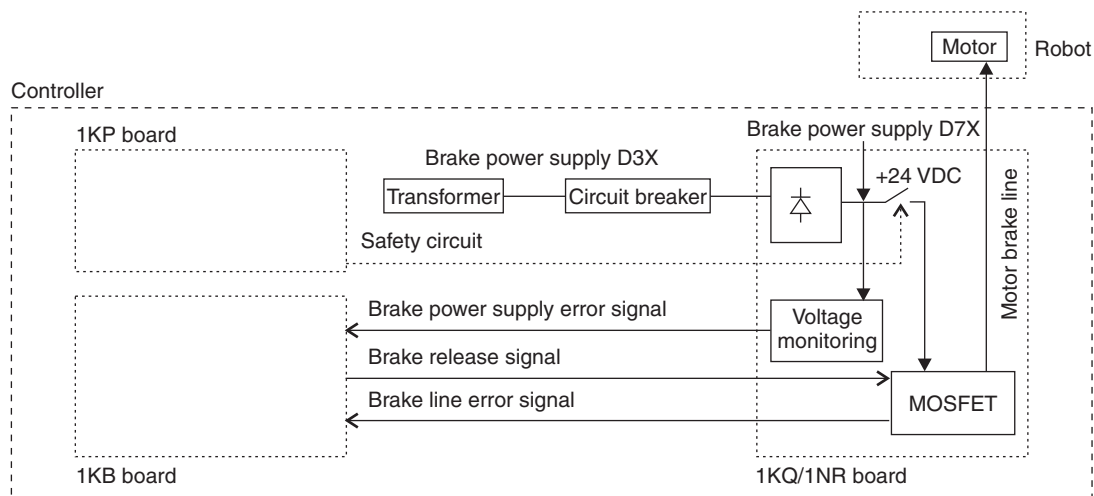
## TROUBLESHOOTING

necessary.

- ⇒ Check and repair brake power line and connections as necessary.
- ⇒ Check and repair connections between 1KB and 1KQ/1NR, 1KB and 1KX/1NX, and 1NR and 1NX as necessary.
- ⇒ Ensure the 1KB board is properly seated in the card rack.
- ⇒ Ensure the 1KP board safety circuit setting is correct.
- ⇒ Replace the 1KB and or the 1KQ/1NR.

### ERROR CODE D1513 Brake power is abnormal. (XX)

This error occurs when the 1KB board detects an error signal sent from the brake power supply, voltage monitoring circuit, on the 1KQ/1NR board.



Main causes include:

1. Defective transformer winding for brake power supply.
2. Short or open in wiring from transformer to brake power supply circuit.
3. Disconnected or defective harness between the 1KB board and the 1KQ/1NR board.
4. 1KB board not properly seated in the 1KX/1NX board.
5. 1NR board not properly seated in the 1NX board.
6. Defective circuit breaker F4 or F4 tripped.
7. Defective MC unit (1KQ board).
8. Defective 1NR board.

- ⇒ Check transformer winding and wiring and repair or replace as necessary.
- ⇒ Repair or replace harness between the 1KB and 1KQ/1NR board.
- ⇒ Ensure the 1NR and or the 1KB boards are properly seated in the 1KX/1NX board.
- ⇒ Replace MC unit.
- ⇒ Reset or replace circuit protector F4 as necessary.
- ⇒ Replace the 1KB and or 1KQ/1NR boards as necessary.

## TROUBLESHOOTING

**ERROR CODE D1514** I/O 24V fuse is open.

Fuse F2 on the 1KP board is open.

Main causes include:

1. Solenoid valve or diode polarity reversed.
2. Current load on the 24 VDC I/O circuit exceeds rating.
3. Short-circuit or ground fault in the 24 VDC I/O harness.
4. Defective 1KP board.

⇒ *Check components for proper polarity and repair as necessary.*

⇒ *Ensure the load on the 24 VDC I/O circuit is within rating.*

⇒ *Check the I/O harness and replace as necessary.*

⇒ *Replace fuse F2 on the 1KP board (after checking for short-circuit).*

⇒ *If the above steps do not correct the problem, replace the 1KP board.*

---

**ERROR CODE D1515** Mismatch in setting of safety circuit as single/double.

Main causes include:

1. Safety circuit setting between the software and hardware do not match.
2. Defective 1KP board.

⇒ *Set SW-2 on the 1KP board to ON for a double circuit or OFF for a single circuit.*

⇒ *In AUX 2021-2 set [2 Line] ON or [1 Line] OFF.*

⇒ *Replace 1KP board.*

---

**ERROR CODE D1516** Mismatch betw hard/software settings for HOLD backup time.

Main causes include:

1. The setting that specifies a two second delay before motor power is set OFF when the RUN/HOLD switch is switched from RUN to HOLD, is not matched between the software and hardware.
2. Defective 1KP board.

⇒ *Set SW-1 on the 1KP board to ON for two second delay or OFF no delay.*

⇒ *In AUX 2021-2 set the delay parameter to [standard] (delay) or [Off] (no delay).*

⇒ *Replace 1KP board.*

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## TROUBLESHOOTING

**ERROR CODE D1517** Blown fuse on safety circuit emergency line.

Fuse F1 on the 1KP board is open.

Main causes include:

1. Incorrect wiring in the emergency line (wiring harness, emergency stop, safety fence, external trigger, teach pendant, limit switches).
2. Short-circuit in the emergency line (wiring harness, emergency stop, safety fence, external trigger, teach pendant, limit switches).
3. Defective 1KP board.

⇒ *Check wiring and components in the safety circuit emergency line and repair/replace as necessary.*

⇒ *Replace 1KP board.*

⇒ *Ensure the controller power is set OFF, when wiring safety circuits. The fuse F1 will blow if wiring is shorted.*

---

**ERROR CODE D1518** Mismatch in the Emer. Stop condition safety circuit.

Main causes include:

1. When the system is set for double safety circuits, and the circuits at the operation panel, teach pendant, and/or the external emergency stop switch are wired as single circuits.
2. Disconnection or ground fault in the emergency stop circuit.
3. Defective 1KP board.

⇒ *With the E-STOP switch(es) engaged, check wiring harness and switches in the circuit and repair or replace as necessary.*

⇒ *Ensure all contacts in the external emergency stop circuit are wired correctly (double circuits).*

⇒ *If the above steps do not correct the problem, replace the 1KP board.*

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## TROUBLESHOOTING

**ERROR CODE D1519** Mismatch of the safety circuit LS condition.

In a double safety circuit system, conditions set for contacts in the limit switch (LS) circuit do not match.

Main causes include:

1. Defective harness connection or harness (short-circuit or ground fault in harness).
2. Defective LS override switch.
3. Defective 1KP board

⇒ *Replace the controller/separate/machine harness(es).*

⇒ *Replace the LS override switch.*

⇒ *Replace the 1KP board.*

---

**ERROR CODE D1520** Mismatch of the safety circuit TEACH/REPEAT condition.

Main causes include:

1. TEACH/REPEAT switch setting and relay conditions for switching teach/repeat modes do not match.
2. Contact condition at the TEACH/REPEAT switch does not match between the first and second safety circuits.
3. Defective 1KP board.

⇒ *Check the TEACH/REPEAT switch and relays (RY5 and RY6 on the 1KP board), and replace as necessary.*

⇒ *Replace the 1KP board.*

---

**ERROR CODE D1521** Mismatch in safety circuit safety-fence condition.

In a double safety circuit system, conditions set for contact at the safety fence circuit do not match.

Main causes include:

1. Incorrect circuit or wiring for safety fence circuit (single circuit wired).
2. Disconnection or ground fault in the safety fence circuit wiring.
3. Defective safety fence switch.
4. Defective 1KP board.

⇒ *Inspect contact points at the safety fence circuit and repair or replace as necessary.*

⇒ *Replace the 1KP board.*

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## TROUBLESHOOTING

**ERROR CODE D1522** Mismatch in cond. of safety circuit enabling device.

In a double safety circuit system, conditions set for contacts at the TRIGGER switch circuit do not match.

### NOTE

If the trigger switch is not pressed firmly, only one contact may engage resulting in this error. The trigger switch has three positions and pressing too firmly may disengage the trigger circuit.

- ⇒ *Replace the teach pendant, teach pendant harness or controller harness to the teach pendant connector.*
  - ⇒ *Replace the 1KP board.*
- 

**ERROR CODE D1523** Mismatch in cond. of safety circuit enabling device.

In a double safety circuit system, conditions set for contacts at the EXTERNAL TRIGGER switch circuit do not match.

- ⇒ *Inspect contacts on the EXT.TRIGGER switch and replace as necessary.*
  - ⇒ *Check for disconnection or short-circuit in external trigger wiring and repair as necessary.*
  - ⇒ *Replace the 1KP board.*
- 

**ERROR CODE D1524** Incorrect operation of the safety relay.

Safety relay on the 1KQ board did not operate correctly.

Main causes include:

1. Defective controller harness.
2. Defective 1KQ board
3. Defective MC unit.
4. Defective 1KP board.

- ⇒ *Replace controller harness.*
  - ⇒ *Replace the 1KQ board.*
  - ⇒ *Replace the MC unit.*
  - ⇒ *Replace the 1KP board.*
-



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## TROUBLESHOOTING

**ERROR CODE D1525**      Incorrect operation of MC (K1).

Main causes include:

1. Defective controller harness.
2. Defective magnetic contactor K1.
3. Defective MC unit (1KQ/1NQ board).
4. Defective 1KP board.

⇒ *Replace controller harness.*

⇒ *Replace magnetic contactor K1.*

⇒ *Replace MC unit (1KQ/1NQ board).*

⇒ *Replace 1KP board.*

---

**ERROR CODE D1526**      Incorrect operation of MC (K2).

Main causes include:

1. Defective controller harness.
2. Defective magnetic contactor K2.
3. Defective MC unit (1KQ/1NQ board).
4. Defective 1KP board.

⇒ *Replace controller harness.*

⇒ *Replace magnetic contactor K2.*

⇒ *Replace MC unit (1KQ/1NQ board).*

⇒ *Replace 1KP board.*

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**ERROR CODE D1527**      Incorrect operation of MC (K3).

Main causes include:

1. Defective controller harness.
2. Defective magnetic contactor K3.
3. Defective MC unit (1KQ/1NQ board).
4. Defective 1KP board.

⇒ *Replace controller harness.*

⇒ *Replace magnetic contactor K3.*

⇒ *Replace MC unit (1KQ/1NQ board).*

⇒ *Replace 1KP board.*

---

## TROUBLESHOOTING

**ERROR CODE D1528**      Controller temperature is out of range.

Temperature inside the controller exceeds specification.

Main causes include:

1. Defective cooling fan(s). For D7X controller, defective heat exchange fan on the left side of the controller.
2. Ambient temperature above specified rating.
3. Defective 1KP board.

⇒ *Inspect cooling fans for proper operation and replace fans and/or fan harness(es) as necessary.*

⇒ *Ensure air inlet filter is not restricted.*

⇒ *Lower ambient temperature within specifications.*

⇒ *Replace the 1KP board.*

---

**ERROR CODE D1529**      Signal harness is disconnected or encoder power error.

This error is caused when a communication error occurs for all axes.

Main causes include:

1. Separate harness disconnected or poor connection.
2. Abnormality in encoder power supply.
3. Low battery voltage on the encoder battery board (1FG/1HG).
4. Defective encoder battery board (1FG/1HG).

⇒ *Ensure proper connections at the separate harness.*

⇒ *Ensure proper encoder power is supplied.*

⇒ *Replace batteries on the encoder battery board (1FG/1HG).*

⇒ *Replace the encoder battery board (1FG/1HG).*

---

**ERROR CODE D1530**      Abnormal current limit of JtXX.

Main causes include:

1. Ground fault in the motor power line U/V/W.
2. Unavailable program data.

⇒ *Check motor power line and replace as necessary.*

⇒ *Modify program data.*

---

---

## TROUBLESHOOTING

**ERROR CODE D1531** Heat sink on power block overheated.

Main causes include:

1. Temperature inside the controller above specification because of air inlet or outlet blockage.
2. Defective cooling fan.
3. Defective power block.

⇒ *Ensure air inlet and outlet ports are clear.*  
⇒ *Ensure cooling fans are in proper working order.*  
⇒ *Replace the power block.*

---

**ERROR CODE D2000** No response from Comm. board for laser sensor.

Laser sensor communication board program stopped.

⇒ *Set robot controller and laser sensor power OFF. Set laser sensor power ON then set robot controller power ON.*

---

**ERROR CODE D2001** RI/O or C-NET board initialize error.

Initial data processing between the 1KA and 1FS/1HS boards is not correctly completed at controller power-up.

Main causes include:

1. Defective 1KA board.
2. Defective 1FS/1HS board.
3. Noise related malfunction.

⇒ *Ensure the 1KA and 1FS/1HS boards are properly seated into the 1KX/1NX board.*  
⇒ *Ensure harnesses are properly connected at the 1KA and 1FS/1HS boards.*  
⇒ *Check for noise malfunction and shield integrity.*  
⇒ *Replace the 1KA board.*  
⇒ *Replace the 1FS/1HS board.*

---

## TROUBLESHOOTING

**ERROR CODE D2002** No response from the arm ID board.

Main causes include.

1. Defective 1KB board.
2. Defective 1KP board.
3. Defective 1GV arm ID board.
4. Defective harness.
5. Noise related malfunction.

⇒ *Replace 1KB board.*  
⇒ *Replace 1KP board.*  
⇒ *Replace 1GV board.*  
⇒ *Replace harness.*  
⇒ *Check for noise malfunction and shield integrity.*

---

**ERROR CODE D2003** No data in the arm ID board.

This error occurs when data is not present in the arm ID board (1GV) memory. This error cannot be reset.

⇒ *Execute the ZROBOT.ZZERO instruction and transfer the data to the arm ID board (1GV).*  
⇒ *Replace the arm ID board (1GV).*

---

**ERROR CODE D2004** Mismatch data in the arm ID board.

This error occurs when robot data, other than the serial number, is different between the arm ID board (1GV) and in the processor board (1KA). This error cannot be reset.

⇒ *Robot data in the controller 1KA board and robot data in the arm ID 1GV board do not match, confirm correct data is used.*  
⇒ *Execute the ZBLTARM\_ALLSET instruction and transfer the data from the controller 1KA board to the arm ID 1GV board.*

---

**ERROR CODE D2005** CC-LINK software version mismatch.

Software versions installed in the 1HS board and AS software are incompatible.

⇒ *Check 1HS board and AS software versions and reload software as necessary.*

---

---

## TROUBLESHOOTING

**ERROR CODE D2006**      Communication board to explosion-proof teach pendant watch-dog error.

This error occurs when the CPU on the communication board (1GS board) for the explosion-proof teach pendant is suspended.

Main causes include:

1. Defective communication board (1GS board).
2. Defective main CPU board (1KA board).

⇒ *Replace defective 1GS board.*

⇒ *Replace defective 1KA board.*

---

**ERROR CODE D2007**      No response from the built-in sequence board.

This error occurs when the built-in PLC is in an error condition or the program mode.

⇒ *Cycle the controller power OFF and ON after the cause of the built-in PLC error is corrected.*

⇒ *Set the built-in PLC to the operating mode.*

---

**ERROR CODE D2008**      Arm ID I/F board error. (code XX).

This error occurs when a communication error exists between the arm ID board interface board (1KP) and the arm ID board (1GV) (abnormal ROM, RAM, DPRAM, etc.).

⇒ *Replace the arm ID board (1GV).*

⇒ *Replace the arm ID interface board (1KP).*

⇒ *Check and repair or replace harnesses and connections as necessary.*

---

**ERROR CODE D2010**      Sync. error between user I/F and arm control board.

1KA and 1KB board synchronization failed for 1 second or more.

⇒ *Replace 1KA board.*

⇒ *Replace 1KB board.*

---

---

## TROUBLESHOOTING

**ERROR CODE D2011**      Parameter download error between user I/F & arm ctrl boards.

1KA and 1KB boards parameter exchange cannot be downloaded.

⇒ *Replace the 1KA board.*

⇒ *Replace the 1KB board.*

---

**ERROR CODE D2012**      SOFT ABSORBER error. Turn OFF & ON the control power.  
(Software absorber function)

Main causes include:

1. Abnormality during soft absorber sequence.
2. 1KB board upload/download is requested, but not executed.

⇒ *Cycle controller power OFF and ON.*

⇒ *Replace the 1KB board.*

⇒ *If the error recurs, contact KRI Customer Service.*

---

**ERROR CODE D2013**      CHANGE GAIN Error. Turn OFF & ON the control power.  
(Change gain function)

Main causes include:

1. Abnormality during change gain sequence.
2. 1KB board upload/download is requested, but not executed.

⇒ *Cycle the controller power OFF and ON.*

---

**ERROR CODE D2014**      Robot network initialize error.

This error occurs when initialization of the Ethernet board is not successful during power-up.

Main causes include:

1. 1KA board components do not correspond to Ethernet option.
2. Ethernet MAC address is not set.
3. Defective 1KA board.

⇒ *Install the appropriate 1KA board and optional 1KN Ethernet board and set the MAC address.*

---

---

## TROUBLESHOOTING

**ERROR CODE D2016** No response from the arm control board.

Request is sent to the 1KB board from the 1KA board and there is no response.

⇒ *Reset error and if error recurs, replace the 1KA/1KB boards.*

---

**ERROR CODE D2017** No response from User I/F board.

1KA board software stopped.

Main causes include:

1. AS software is not installed correctly or is corrupt.
2. Defective 1KA board.

⇒ *Reinstall correct AS software.*

⇒ *Replace 1KA board.*

---

**ERROR CODE D2018** [ARM CTRL BOARD] no response.

1KB board software stopped.

Main causes include:

1. AS software is not installed correctly or is corrupt.
2. Defective 1KB board.

⇒ *Reinstall correct AS software.*

⇒ *Replace 1KB board.*

---

**ERROR CODE D2019** [ARM CTRL BOARD] servo software no response.

1KB board software stopped.

Main causes include:

1. Servo software is not installed correctly or is corrupt.
2. Defective 1KB board.

⇒ *Reinstall correct 1KB board servo software to the 1KA board.*

⇒ *Replace 1KB board.*

---

---

## TROUBLESHOOTING

**ERROR CODE D2020** [ARM CTRL BOARD] servo control software no response.

1KB board software stopped.

Main causes include:

1. Servo software is not installed correctly or is corrupt.
2. Defective 1KB board.

⇒ *Reinstall correct 1KB board servo software to the 1KA board.*

⇒ *Replace 1KB board.*

---

**ERROR CODE D2021** Arm data file is not found.

When robot model is selected, data file corresponding to the installed arm is not found in the system file.

⇒ *Contact KRI customer service (include operating conditions/settings at the time the error occurred).*

---

**ERROR CODE D2022** Arm data is not found.

When robot model is selected, the arm data in the arm data file did not match the selected robot.

⇒ *Ensure the correct model setting is used.*

⇒ *Ensure the correct software version is installed.*

---

**ERROR CODE D2023** Failed to load arm data.

When robot model is selected, the arm data file for the selected robot model is incompatible with the AS software.

⇒ *Ensure the correct model setting is used.*

⇒ *Ensure the correct software version is installed.*

---



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## TROUBLESHOOTING

**ERROR CODE D2024** [ARM CTRL BOARD] robot type setting failed.

System software is not compatible with the robot model set in the AS software.

- ⇒ *Ensure the correct model setting is used.*
  - ⇒ *Ensure the correct software version is installed.*
- 

**ERROR CODE D2025** Robot codes set in software and Arm ctrl board do not match.

Robot model hardware and software settings do not match.

- ⇒ *Ensure 1KB board dip switch S2 setting is correct.*
  - ⇒ *Use AUX 0804 or AS Language ID monitor command to ensure correct software version is installed.*
- 

**ERROR CODE D2026** Code set in software & curr. sensor I/F b'd do not match.

1GM daughter board on the 1KB board does not match hardware or software settings.

- ⇒ *Ensure correct 1GM board is installed.*
  - ⇒ *Ensure 1KB board dip switch S2 setting is correct.*
  - ⇒ *Use AUX 0804 or AS Language ID monitor command to ensure correct software version is installed.*
- 

**ERROR CODE D2027** Codes set in software and power block do not match.

Power block settings and hardware or software settings do not match.

- ⇒ *Ensure correct power block is installed.*
  - ⇒ *Ensure power block jumper settings are correct.*
  - ⇒ *Use AUX 0804 or AS Language ID monitor command to ensure correct software version is installed.*
-

---

## TROUBLESHOOTING

**ERROR CODE D2028** (SSCNET) initialization error. (code XX).

The Mitsubishi single axis amplifier failed to initialize at controller power-up. A 2 byte code follows the error message. The higher byte indicates axis number and the lower byte indices the error code.

Higher byte:

0: system error.

Any other number: axis number that caused error.

Lower byte:

1: 1LP daughter board not installed to 1KB board.

3: Mitsubishi amplifier/motor not connected to the specified axis.

2, 4, 5: Other problems.

⇒ *Lower byte 1: install 1LP board.*

⇒ *Lower byte 3: connect amplifier or motor.*

⇒ *Lower byte 2, 4, 5: replace the 1LP board, amplifier or motor.*

---

**ERROR CODE D2029** Motor codes in software & Arm control b'd mismatch. (Jt-A)

Software and hardware motor code settings, of axis assigned to channel 7 (seventh axis), do not match.

⇒ *Ensure 1KB board dip switch S8 setting is correct.*

⇒ *Ensure correct AS and servo software are installed.*

---

**ERROR CODE D2030** Codes set in software and curr. sensor I/F b'd mismatch. (Jt-A)

Software and hardware settings, for the axis assigned to channel 7 (seventh axis), do not match 1KV board settings.

⇒ *Ensure 1KB board dip switch S8 setting is correct.*

⇒ *Ensure correct AS and servo software are installed.*

---

---

## TROUBLESHOOTING

**ERROR CODE D2031** Codes set in software and on add'l pwr block mismatch. (Jt-A)

Software and hardware settings, for the axis assigned to channel 7 (seventh axis), do not match power block settings.

- ⇒ *Ensure correct power block is installed.*
  - ⇒ *Ensure power block jumper settings are correct.*
  - ⇒ *Use AUX 0804 or AS Language ID monitor command to ensure correct software version is installed.*
- 

**ERROR CODE D2032** Motor codes set in software and Arm ctrl b'd. (Jt-B)

Software and hardware motor code settings, for the axis assigned to channel 8 (eight axis), do not match.

- ⇒ *Ensure 1KB board dip switch S8 setting is correct.*
  - ⇒ *Ensure correct AS and servo software are installed.*
- 

**ERROR CODE D2033** Codes set in software & curr. sensor I/F b'd mismatch. (Jt-B)

Software and hardware settings for the axis assigned to channel 8 (eight axis) do not match 1KV board settings.

- ⇒ *Ensure 1KB board dip switch S8 setting is correct.*
  - ⇒ *Ensure correct AS and servo software are installed.*
- 

**ERROR CODE D2034** Codes set in software and on add'l pwr block mismatch. (Jt-B)

Software and hardware settings for the axis assigned to channel 8 (eight axis) do not match power block settings.

- ⇒ *Ensure power block jumper settings are correct.*
  - ⇒ *Ensure correct AS and servo software are installed.*
-

---

## TROUBLESHOOTING

**ERROR CODE D2035** Program execution error.

Program failed to start when cycle start command was issued.

- ⇒ *Reset the error, and restart the program.*
  - ⇒ *If the error recurs, contact KRI Customer Service.*
- 

**ERROR CODE D2036** (SSCNET) system error occurred in 1LP I/F board. (code XX)

Main causes include:

1. Defective 1LP board (1KB daughter board)
2. 5 VDC power supply voltage dropped to 4.5 VDC or less.

- ⇒ *Replace 1LP board.*
  - ⇒ *Adjust 5 VDC power supply to specifications then cycle controller power OFF and ON.*
- 

**ERROR CODE D4500** Fieldbus interface board is not detected.

The I/F board specified in AUX 0608-2 is not installed.

- ⇒ *Set controller power OFF and install the specified I/F board.*
  - ⇒ *If specified I/F board is installed, verify proper installation.*
  - ⇒ *Ensure settings in AUX 0608-2 are correct.*
  - ⇒ *Ensure I/F board LED indicator displays proper operation.*
  - ⇒ *Ensure 1JF board jumper settings are correct.*
- 

**ERROR CODE D4501** ABMA-PDP) I/F module error. XX

Improperly installed or defective ABMA-PDP module

- ⇒ *Check error code.*
  - ⇒ *Ensure 1JF board and I/F board are properly installed and cycle controller power OFF and ON.*
  - ⇒ *If error recurs, check LED1 on the I/F card.*
    - If the LED is ON, execute configuration.*
    - If the LED is OFF, contact I/F card manufacturer.*
-

---

## TROUBLESHOOTING

### **ERROR CODE D4502** FIELD-BUS-INIT) Error Reply. XX

At fieldbus start-up, a mismatch in length of I/O data with the node at the end of the connection is detected when a message is sent to the fieldbus I/F card, or maximum I/O data length is exceeded.

- ⇒ Check the I/F card LED display. Match the I/O data length with the master.
  - ⇒ Ensure I/O data length is within length specified for the fieldbus I/F card.
  - ⇒ Cycle controller power OFF and ON.
  - ⇒ Replace fieldbus cable.
  - ⇒ If this error recurs, contact KRI Customer Service (include sub-code XX).
- 

### **ERROR CODE D4503** FIELD-BUS-INIT) Reply timeout XX.

At fieldbus start-up, no response is detected due to defective hardware or incorrect settings during I/F board initialization.

- ⇒ Check the I/F card LED display.
  - ⇒ Ensure the master and slave I/O data length match.
  - ⇒ Cycle controller power OFF and ON.
  - ⇒ Replace the fieldbus cable.
  - ⇒ If this error recurs, contact KRI Customer Service (include sub-code XX).
- 

### **ERROR CODE D4504** ANYBUS) OUT/FB.CTRL request timeout. XX

Reading input signal area access is requested but denied due to hardware problem.

- ⇒ Check the I/F card LED display and reset the error.
  - ⇒ If this error cannot be reset, contact KRI Customer Service (include sub-code XX).
-

## TROUBLESHOOTING

### 1.3.2.2 EXXXX NON-FATAL ERROR CODES

**ERROR CODE E0001** Unknown error.

Unregistered error occurred.

⇒ *Contact KRI customer service (include operating conditions/settings and operation log at the time the error occurred).*

---

**ERROR CODE E0100** Abnormal comment statement exists.

Statements containing incorrect AS Language syntax can be included in a program as comments. If the comment is not preceded with a semicolon (;) the step is executed as a step and an error is generated.

⇒ *Correct program comment syntax (add preceding semicolon).*  
⇒ *Delete incorrect program step.*

---

**ERROR CODE E0101** Nonexistent label.

Occurs when executing a GOTO command and the destination label is not defined.  
Example: "IF x>0 GOTO 10" is specified, but the label "10" is not included in a program step an error is generated.

⇒ *Ensure valid labels are used within the program.*  
⇒ *Delete the reference to the nonexistent label.*

---

**ERROR CODE E0102** Variable is not defined.

Main causes include:

1. Variable data for a specific command/instruction is not defined.  
Example: "x=SIN(y)" is specified and "y" is not defined.
2. Command/instruction contains incorrect AS Language syntax.  
Example: "PCEND pcprog1" should be "PCEND 1".

⇒ *Ensure variables are properly defined.*  
⇒ *Ensure correct AS Language command/instruction syntax is used.*

---

---

## TROUBLESHOOTING

**ERROR CODE E0103**      Location data is not defined.

Main causes include:

1. The location variable for the BASE, TOOL or POINT command is not specified.  
Example: "TOOL a" is specified and "a" is not defined.
2. DEST or #DEST function is used and the destination data is not defined.

⇒ *Ensure all locations used in programs and functions are defined.*

---

**ERROR CODE E0104**      String variable is not defined.

String variables evaluated by ASC and LEN functions are not defined.  
Example: "ASC("\$sample")" is specified and "\$sample" is not defined.

⇒ *Define the string variables to be evaluated or correct the name of the string variable used for evaluation.*

---

**ERROR CODE E0105**      program or label is not defined.

The program name or label associated with an ON or ONI command does not exist.

⇒ *Define the program or label used with the ON or ONI command.*

---

**ERROR CODE E0106**      Value is out of range.

The numeric value entered exceeds the upper or lower limits of the acceptable range.  
Example: "SPEED 10000" exceeds maximum value of 100.

⇒ *Enter data that is within acceptable range.*

---

**ERROR CODE E0107**      No array suffix.

Attempt to process an array variable with undefined suffixes, i.e., attempting to process A=B[C,D,E], but C, D, E have no values.

⇒ *Rewrite the program to define the array suffix before attempting to process the array.*

---

---

## TROUBLESHOOTING

### **ERROR CODE E0108** Divided by zero.

Occurs when the system encounters a mathematical evaluation that involves division by "0". Typically associated with the FRAME function and circular interpolation.

⇒ *Check data source for calculations.*

---

### **ERROR CODE E0109** Floating point overflow.

Occurs when the system encounters a numeric floating point overflow in using arithmetic (+, -, \*, /) or logical (AND, OR, etc.) operators. This also occurs when converting a numeric argument to an integer value.

⇒ *Correct the program. Integer values with full precision ranges are from -16,777,216 to 16,777,216. For more information refer to the D Series Controller AS Language Reference Manual.*

---

### **ERROR CODE E0110** String too long.

Character strings associated with arithmetic or comparative operators or the LEN function are too long (255 character maximum).

⇒ *Correct the character string.*

---

### **ERROR CODE E0111** Attempted operation with neg. exponent.

Numeric values that have exponents must be positive in value.

⇒ *Correct equations in program.*

---

### **ERROR CODE E0112** Too complicated expression.

Encountered numeric calculation too complex to be evaluated.

⇒ *Simplify mathematical equations.*

---



---

## TROUBLESHOOTING

**ERROR CODE E0113** No expressions to evaluate.

The type of data in an argument is incompatible with the operation being performed.

⇒ *Correct the program to evaluate compatible expressions.*

---

**ERROR CODE E0114** SQRT parameter is negative.

In the argument of a SQRT function, a negative number is entered for evaluation.

Example: "x=SQRT(-2)" causes an error. "x=SQRT(2)" is acceptable.

⇒ *Do not enter negative numbers for SQRT function evaluation.*

---

**ERROR CODE E0115** Array suffix value outside range.

Occurs when the array suffix number exceeds the acceptable range from 0 to 9999.

Example: "DECOMPOSE x[10000]=a" causes an error. "DECOMPOSE x[1]=a" is acceptable.

⇒ *Ensure the range of array suffixes are acceptable.*

---

**ERROR CODE E0116** Faulty or missing argument value.

Displayed when the parameter specified for a command or an instruction is illegal.

Example: "TOOL 2112" (after the TOOL command a defined transformation location or null is expected, 2112 causes an error).

⇒ *Use correct argument values.*

---

**ERROR CODE E0117** Incorrect joint number.

The joint number entered does not exist or is in the wrong format.

⇒ *Retype the command using the correct joint number and format.*

---

## TROUBLESHOOTING

**ERROR CODE E0118** Too many subroutine calls.

Occurs when more than 20 subroutines are nested with EXTCALL or CALL instructions.

⇒ *Do not exceed 20 nested subroutines.*

---

**ERROR CODE E0119** Nonexistent subroutine.

Displayed when the program specified by a CALL, ON, or ONI instruction does not exist.

⇒ *Select only existing programs to be run as subroutines.*

---

**ERROR CODE E0903** Check sum error of system data.

The check sum of the system data of the AS software is changed when the system information such as model number, number of axes, and option setting is downloaded. When the error occurs in situations other than software download, the error is caused by defective memory battery back-up, defective 1KA board, or memory error from noise.

⇒ *Use AUX 0803 Clear Check Sum Error or CHSUM command to reset the data. When the error cannot be reset using the check sum commands, the command with the abnormality is shown. Rewrite the command and use CHSUM or AUX 0803 to clear the error.*

⇒ *Check the memory backup battery. Replace if necessary.*

⇒ *Replace the 1KA board if the error recurs.*

### NOTE

A robot data sheet is supplied with each robot. The robot data sheet contains a list of factory settings and can be used to reenter original factory settings. If system data or options change the robot data sheet should be updated to provide correct robot information when needed.

**ERROR CODE E1000** ADC channel error.

This error occurs when an A/D converter channel number other than 1–8 is used.

⇒ *Ensure the correct A/D converter channel number is used (1–8).*

---

---

## TROUBLESHOOTING

**ERROR CODE E1001**      ADC input range error.

This error occurs when an A/D converter input voltage is incorrect.  
The correct analog input voltage ranges are:

1. 0– +10 V
2.  $\pm 5$  V
3.  $\pm 10$  V

⇒ *Ensure the correct analog input voltage range is used.*

---

**ERROR CODE E1002**      PLC interface error.

This error occurs when signal communication is not available between the 1KA board and the PC3JB board (TOYOPUC PLC).

**NOTE**

When this error occurs, set motor power to OFF to prevent external signal input.

⇒ *Replace PC3JB (TOYOPUC PLC).*  
⇒ *Replace 1KA board.*

---

**ERROR CODE E1003**      Built-in PLC is not installed.  
[Option: PC3JB (PLC) correspondence]

Main causes include:

1. The system checks for proper installation and operation of the PC3JB board (TOYOPUC PLC) on power-up.
2. This error occurs if PLCSAVE or PLCLOAD is executed and the PC3JB board (TOYOPUC PLC) is not installed.
3. This error occurs if the PC3JB board (TOYOPUC PLC) is not installed and operating properly.

⇒ *Replace PC3JB (TOYOPUC PLC).*  
⇒ *Replace 1KA board.*

---

## TROUBLESHOOTING

### **ERROR CODE E1004** Interbus board is not ready.

At 1JF board start-up, the board did not achieve the ready state within the required time.

- ⇒ *Cycle controller power OFF and ON.*
  - ⇒ *Ensure the 1JF board is correctly installed.*
  - ⇒ *Replace the 1JF board.*
- 

### **ERROR CODE E1005** Spin axis encoder difference error.

At controller power-up or RTSET execution, the current value is substantially different than the calculated encoder value for the spin axis.

- ⇒ *Perform the spin axis zeroing procedure (zeroing data is not set). Refer to the Spin Control Function (Option) Manual for the spin axis zeroing procedure.*
- 

### **ERROR CODE E1006** Touch panel switch is short-circuited.

This error occurs if a touch panel key is pressed or the TEACH/REPEAT switch position is changed during controller power-up.

- ⇒ *Do not touch any touch panel keys or change the position of the TEACH/REPEAT switch during controller power-up.*
  - ⇒ *Replace the teach pendant.*
- 

### **ERROR CODE E1007** Power sequence board is not installed.

The first address of the No.1 1KP power sequence board cannot be read at controller power-up.

Main causes include:

1. The 1KP power sequence board is not installed in the correct card slot.
2. Jumper or dip switch settings of the 1KP power sequence board are incorrect.
3. Defective 1KP power sequence board.

- ⇒ *Ensure the 1KP board DSW1 setting is configured as power sequence board No. 1 and is installed in the 1KP card rack slot. Check and replace the board if necessary.*
-

---

## TROUBLESHOOTING

**ERROR CODE E1008** No.2 power sequence board is not installed.

The first address of the No.2 1KP power sequence board cannot be read at controller power-up.

Main causes include:

1. The 1KP power sequence board is not installed in the correct card slot.
2. Jumper or dip switch settings of the 1KP power sequence board are incorrect.
3. Defective 1KP power sequence board.

⇒ *Ensure the 1KP board DSW1 setting is configured as power sequence board No. 2 and is installed in the No. 2 1KP card rack slot. Check and replace the board if necessary.*

---

**ERROR CODE E1009** No. XX I/O board is not installed.

Cannot read the first addresses of I/O boards (1GW/1HW) based on the number of signals that have been set in AUX 0611 or with DO (output point), or DI (input point) of the ZSIGSPEC command, at controller power-up. This error is not used when a 1FS board is installed.

Main causes include:

1. Incorrect value set in AUX 0611 or with the ZSIGSPEC command.
2. Error in board address of I/O board (1GW/1HW).
3. Defective I/O board or I/O board not installed (1GW/1HW board, etc.).

⇒ *Set the correct number of signals in AUX 0611 or with the ZSIGSPEC command. I/O cards are typically mounted in the card rack from right to left in ascending order. Because of VME buss communication, this is not critical. The robot can run without I/O boards. The maximum number of signals in the software set in AUX 0611, or with the ZSIGSPEC command, is DO, DI=256, INT=512, but DO and DI are restricted by hardware and other options.*

⇒ *Set board address jumpers correctly.*

⇒ *Replace the 1GW/1HW board.*

---

---

## TROUBLESHOOTING

### **ERROR CODE E1010**      Power sequence board detects error.

An error signal, not classified through the error summary, is generated by the 1KP board and is sent to the 1KB board. This error occurs when the error signal sent from the 1KP board is not recognized by the AS software.

Main causes include:

1. The error detection function of the 1KP power sequence board does not correspond to the error processing function of the AS software.
2. AS software is not installed correctly or is corrupt.
3. Defective 1KP power sequence board.
4. Defective 1KB board.

⇒ *Ensure the correct version of AS software is installed.*

⇒ *Replace the 1KP power sequence board.*

⇒ *Replace the 1KB board.*

---

### **ERROR CODE E1011**      Built-in sequence board is not installed.

Installation of the built-in (Sharp) sequence board is checked at controller power-up.

⇒ *Install the built-in (Sharp) sequence board.*

⇒ *Ensure the built-in (Sharp) sequence board is properly installed.*

⇒ *If the built-in (Sharp) sequence board is not used, change the settings so the controller does not check for the built-in (Sharp) sequence board.*

#### **NOTE**

The PC3JB board (*TOYOPUC PLC*) is not recognized as a built-in sequence board.

---

### **ERROR CODE E1012**      RI/O board or C-NET board is not installed.

This error occurs at controller power-up and the first address of the RI/O board is not read (1GW/1HW, 1FS etc.).

1. The RI/O or C-Net board is not installed.
2. Defective RI/O or C-Net board.

⇒ *Ensure the RI/O or C-Net board is installed.*

⇒ *Replace the RI/O or C-Net board.*

---

---

## TROUBLESHOOTING

**ERROR CODE E1013** InterBus board is not installed.

The 1JF board is not installed.

⇒ *Ensure the 1JF board is properly installed.*

⇒ *Replace the 1JF board.*

---

**ERROR CODE E1016** No. XX CC-LINK board is not installed.

The specified number 1HS board is not installed.

⇒ *Installed the specified number 1HS board.*

⇒ *Ensure the specified number 1HS board is properly installed.*

⇒ *Replace the specified number 1HS board.*

---

**ERROR CODE E1017** PLC error. Error code is Hex. XX.

This error occurs when a PC3JB (TOYOPUC) internal error is present (program memory check sum error, parameter setting error, etc.).

⇒ *Refer to the PC3JB (TOYOPUC) manual for the code (Hex. XX).*

⇒ *Replace the PC3JB (TOYOPUC).*

---

**ERROR CODE E1018** INTER-BUS status error.

A processing error such as cable disconnection is detected at the 1JF board during communication.

⇒ *Refer to the 1JF board manual for information for checking error state displayed by the front LED.*

⇒ *Replace the 1JF board.*

---

**ERROR CODE E1020** External equipment is abnormal.

An abnormality in peripheral equipment is detected by the PC3JB board (TOYOPUC).

⇒ *Check PC3JB board (TOYOPUC) peripheral equipment connections.*

⇒ *Ensure proper installation and connection of peripheral equipment.*

---

## TROUBLESHOOTING

**ERROR CODE E1021** Arm ID board error. (code XXX).

Code	Description
4AH	Arm ID board data is not normal or is corrupt
4FH	Writing error to arm ID board memory <sup>1</sup>
C1H	Communication check sum error <sup>2</sup>
C5H	Communication protocol error <sup>2</sup>
C6H	Communication response time-out error <sup>2</sup>
FFH	Other errors (unknown error) <sup>3</sup>

<sup>1</sup>Cannot write to arm ID board memory. Replace arm ID board.

<sup>2</sup>Damaged or disconnected communication cable.

<sup>3</sup>F\*H cycle controller power ON and OFF. If error does not clear, further diagnosis is needed (possible damaged arm ID board or power sequence board).

Main causes include:

1. Defective harness.
2. Defective serial flash memory on the 1GV board.
3. Defective 1GV board.
4. Defective 1KP board.

⇒ *Replace harness.*

⇒ *Replace serial flash memory on the 1GV board.*

⇒ *Replace 1GV board.*

⇒ *Replace 1KP board.*

---

**ERROR CODE E1022** Power sequence board error. (code XX)

Main causes include:

1. Defective harness.
2. Defective 1KP board.

⇒ *Replace harness.*

⇒ *Replace 1KP board.*



## TROUBLESHOOTING

**ERROR CODE E1023**      Communication error in robot network.

Main causes include:

1. Communication between robots is not normal during cooperative motion operation.
2. Power to one of the controllers connected to the network is not set ON.

⇒ *Ensure network cables and connections are correct.*

⇒ *Ensure robot network settings are correct.*

⇒ *Ensure power for all controller connected to the network is set ON.*

---

**ERROR CODE E1024**      EXT.AXIS release sequence error. (code XX)

Occurs when a gun disconnect is not normally completed.

Code	Description
<b>0</b>	No response from servo software.
<b>EF**</b>	Could not be executed because RGSO is ON.
<b>FF**</b>	Could not be executed because RGSO is ON.
<b>EE**</b>	Code pertaining to other than release/connection.
<b>FE**</b>	Code pertaining to other than release/connection.
<b>ED**</b>	Release/connection operation did not complete normally.
<b>FD**</b>	Release/connection operation did not complete normally.
<b>200</b>	Gun did not return within motion range after calibration.

Main causes include:

1. No response from servo software at external axis release.
2. Defective 1KB board.
3. Defective 1KP board.

⇒ *Check cables and replace as necessary.*

⇒ *Replace the 1KB board.*

⇒ *Replace the 1KP board.*

⇒ *Reinstall servo software.*

---

## TROUBLESHOOTING

### ERROR CODE E1025 EXT AXIS connecting error. (code XX)

Occurs when the gun axis connection is not normally completed.

Code	Description
0	No response from servo software.
EF**	Could not be executed because RGSO is ON.
FF**	Could not be executed because RGSO is ON.
EE**	Code pertaining to other than release/connection.
FE**	Code pertaining to other than release/connection.
ED**	Release/connection operation did not complete normally.
FD**	Release/connection operation did not complete normally.
200	Gun did not return within motion range after calibration.

Main causes include:

1. Motion range for gun or the limit value for clamping force is not set correctly.
2. Defective gun or gun brake circuit.
3. No response from servo software.
4. Defective 1KB board.
5. Defective 1KP board.

- ⇒ *Verify that the servo gun's upper and lower limits are correctly set in AUX 1011.*
- ⇒ *Use the gun brake release switch, release the gun's brake. Manually move the gun to check for mechanical binding.*
- ⇒ *Adjust the clamping force in AUX 1021.*
- ⇒ *Reinstall the servo software.*
- ⇒ *Check brake circuit and repair as necessary.*
- ⇒ *Replace the 1KB board.*
- ⇒ *Replace the 1KP board.*

---

### ERROR CODE E1026 Main CPU mismatch.

This error occurs when there are conflicting CPU cache settings.

- ⇒ *Change the CPU cache setting to "No" and cycle controller power OFF and ON.*
  - ⇒ *Use the ZCPUCACH instruction to set the CPU cache setting to "OFF".*
-

## TROUBLESHOOTING

### ERROR CODE E1027 Safety circuit was cut OFF.

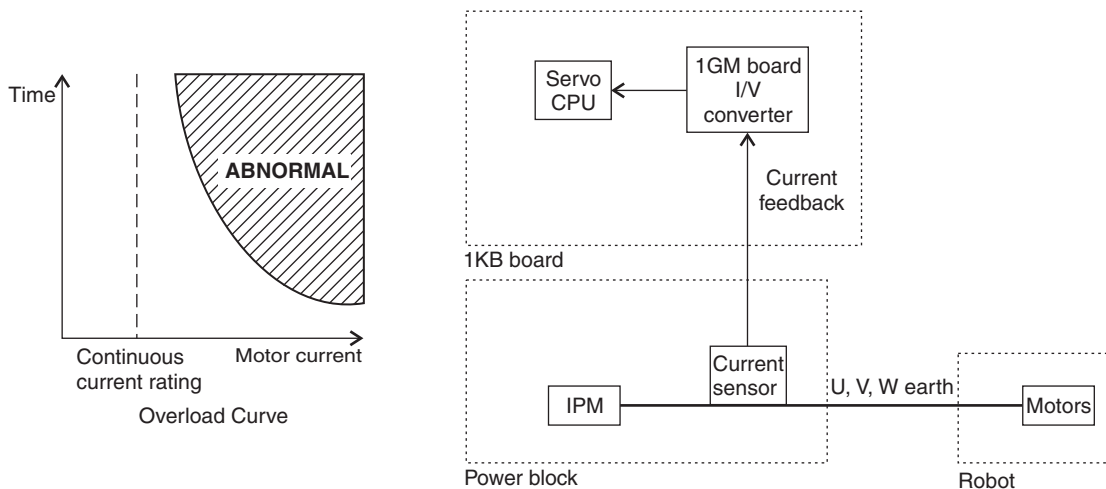
The safety gate branch of the safety circuit is open due to a missing safety plug or defective circuit.

⇒ *Reinsert the safety plug.*

⇒ *Repair open circuit.*

### ERROR CODE E1028 Jt XX Motor overload.

The current feedback from the power block exceeded maximum continuous ratings longer than the time allowed.



Main causes include:

Mechanical-

1. The robot arm has contacted an external item hindering movement.
2. The harness is caught in the robot arm.
3. The cyclo reduction unit, the gear, or the bearing(s) are damaged.
4. Gear cyclo reduction unit backlash is too narrow.
5. Payload weight exceeds robot specifications for capacity.
6. Robot motion pattern exceeds ratings of the motor.
7. Motor brake is not released.

Electrical-

1. Motor power line U, V, and W phase are disconnected.
2. The brake line is disconnected or brake drive circuit is damaged.
3. The power block is damaged.
4. Defect in the 1KQ/1NR board.
5. Defect in the 1KB servo board.

## TROUBLESHOOTING

6. Malfunction of the motor.

7. Servo spot weld gun:

- Clamping pressure and/or clamping time is excessive.
- Distance between weld points is short; the motor does not have time to cool sufficiently between welds.
- Clamping pressure setting exceeds the servo gun motor power capacity.

⇒ *Check the cyclo reduction unit, the gear, or the bearing(s) for mechanical failure.*

*Replace as necessary.*

⇒ *Re-teach the robot motion as necessary.*

⇒ *Check the harness and servo unit for electrical malfunctions and replace if necessary.*

⇒ *Replace the 1KB board.*

⇒ *Replace the 1KQ/1NR board.*

### **Servo Spot Weld Gun**

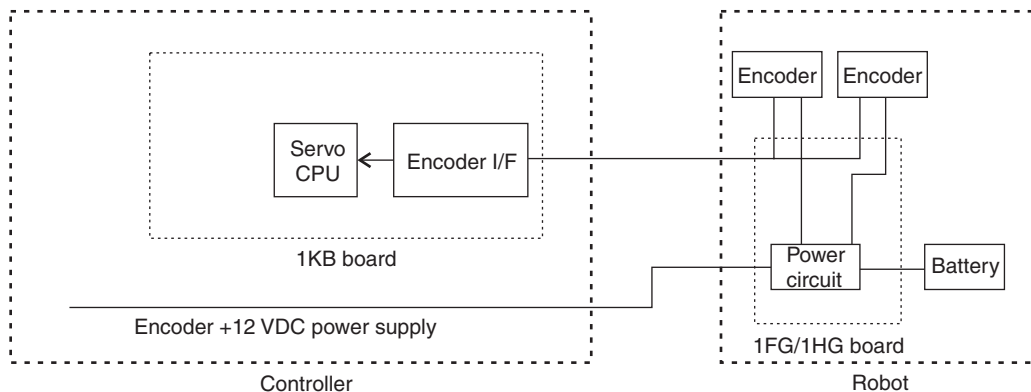
⇒ *If the weld points are close to each other, set a time delay. This provides a cool-down period for the servo gun motor.*

⇒ *Set the clamping force lower (see servo gun manufacturer's specifications).*

---

**TROUBLESHOOTING****ERROR CODE E1029** Encoder rotation data is abnormal. (Jt XX)

Occurs when there is a difference (+2 rotations or more) between the rotation data in the serial encoder data and the rotation data calculated using the incremental technique.



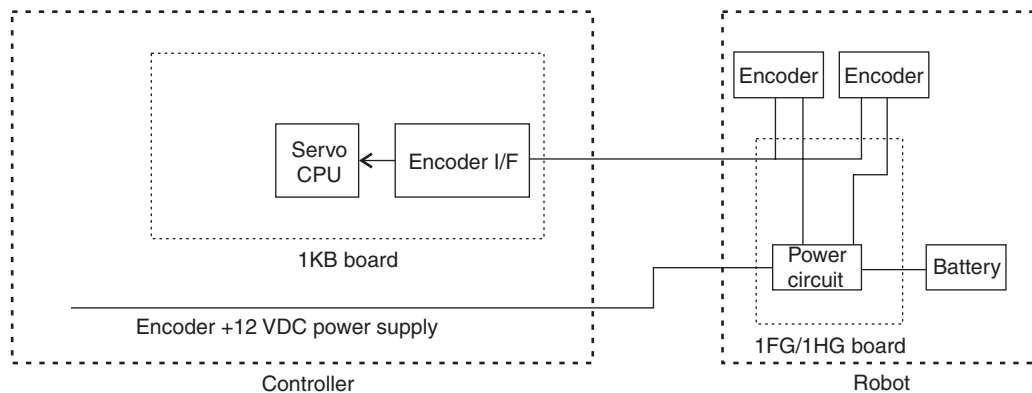
- ⇒ Check connections at encoder, 1FG/1HG board, and separation harness.
- ⇒ Check for noise and shield integrity.
- ⇒ Ensure the 1KB board is properly seated into the card rack.
- ⇒ Check for continuity in the machine harness and separation harness.
- ⇒ Replace 1FG/1HG board.
- ⇒ Replace the 1KB board.
- ⇒ Replace the encoder.

**For additional information on error code E1029, see section 1.4.**

## TROUBLESHOOTING

### ERROR CODE E1030 Encoder data abnormal. (Jt XX)

When control power is switched ON, the current encoder value is compared to the stored encoder value when the power is turned OFF. If the difference is more than the value set in AUX 0504 Encoder Error Range, or by the ENCCCHK\_DATA command, this error occurs.



Main causes include:

1. Value set in AUX 0504 is too small.
2. Backup battery failure due to disconnection or discharged battery (+3.3 VDC or less).
3. Control power is turned off during robot motion by an abnormal power supply, etc., causing the robot to stop in a position other than the last position stored in the AS software.
4. Motor replacement/encoder replacement (zeroing must be performed).
5. Robot arm or motor operated by force when control power is off.
6. Controller was initialized (this error occurs for all axes).
7. Servo spot weld gun.
  - Loose connection at tool changer.
  - Defective tool changer harness.

- ⇒ Ensure the value set in AUX 0504 is correct.
- ⇒ Data may have been lost due to backup battery. See error W1013. Replace the battery. There is a possibility that internal encoder data may be lost. Check the robot zeroing.
- ⇒ Check connections at tool changer, clean connections, replace harness as necessary.
- ⇒ Check each harness for short circuit and repair, or replace, as necessary.
- ⇒ Replace the encoder, the 1KB board or the 1FG/1HG encoder battery backup board as necessary.
- ⇒ After repair is complete, confirm correct program playback in check mode before running program in repeat mode.

## TROUBLESHOOTING

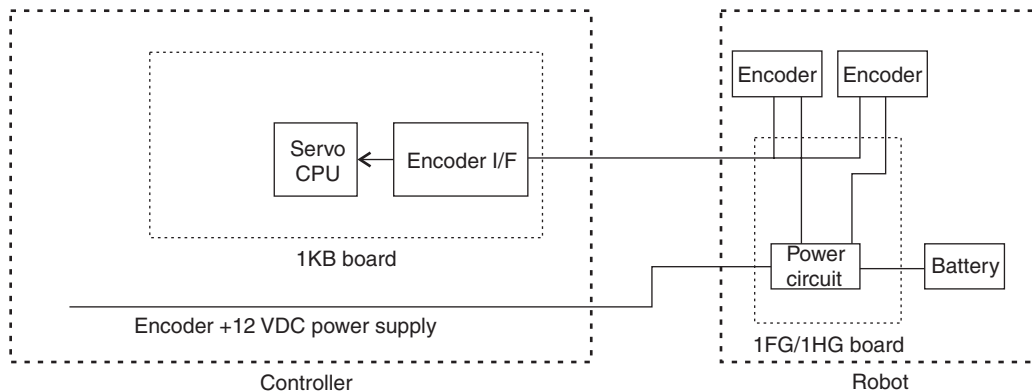
**ERROR CODE E1031** Miscount of encoder data (Jt XX).

The servo gun or tool changer harness is defective.

⇒ *Inspect the servo gun and tool changer harnesses; replace if necessary.*

**ERROR CODE E1032** Mismatch ABS and INC encoder data (Jt XX).

Occurs when there is a large difference between the value in the serial encoder data and the calculated data using the incremental technique.



Main causes include:

1. Defective encoder or encoder harness.
2. Defective 1KB board.
3. Noise related malfunction.
4. Defective 1FG/1HG board.
5. Servo spot weld gun.
  - Loose connection at tool changer.
  - Defective tool changer harness.

⇒ *Replace encoder, replace 1KB board.*

⇒ *Check connections at encoder, 1FG/1HG board, and separation harness.*

⇒ *Ensure the 1KB board is properly seated into the card rack.*

⇒ *Check for continuity in the machine harness and separation harness.*

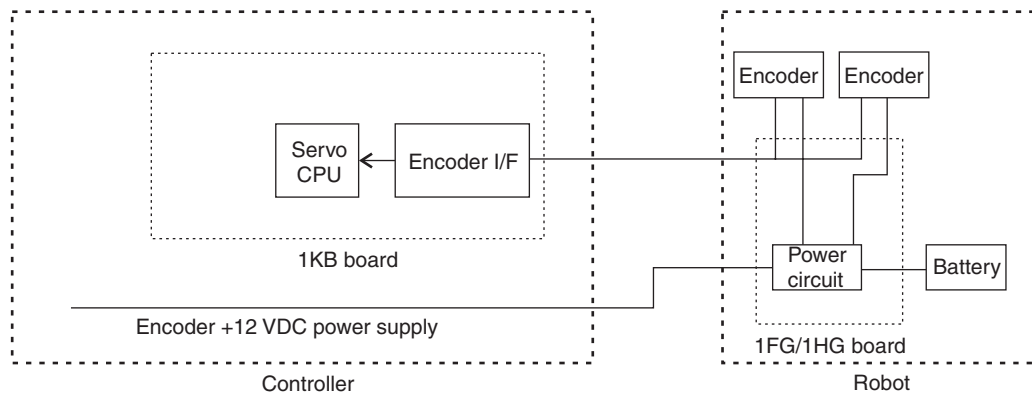
⇒ *Check for noise and shield integrity.*

⇒ *Replace 1FG/1HG board.*

**For additional information on error code E1032, see section 1.4.**

**TROUBLESHOOTING****ERROR CODE E1034** Encoder initialize error (Jt XX).

The encoder is not able to read the absolute position at control power on. The scanning of absolute data begins immediately after a shift from the state of non-operation, or back-up operation, to normal encoder operation. BUSY=1 is output until the absolute position has been determined.



Main causes include:

1. Encoder rotated at 300 RPM or more at controller power-up (including conveyor encoder).
2. Defective encoder or encoder harness.
3. Defective 1KB, 1KQ/1NR, or 1GF/1HG board.
4. Defective manual brake release.

⇒ In the case of a conveyor encoder, ensure power-up speed is below 300 RPM.

⇒ Check connections at encoder, 1FG/1HG board.

⇒ Ensure the 1KB board is properly seated into the card rack.

⇒ Replace encoder, replace 1KB, 1KQ/1NR, or 1FG/1HG board.

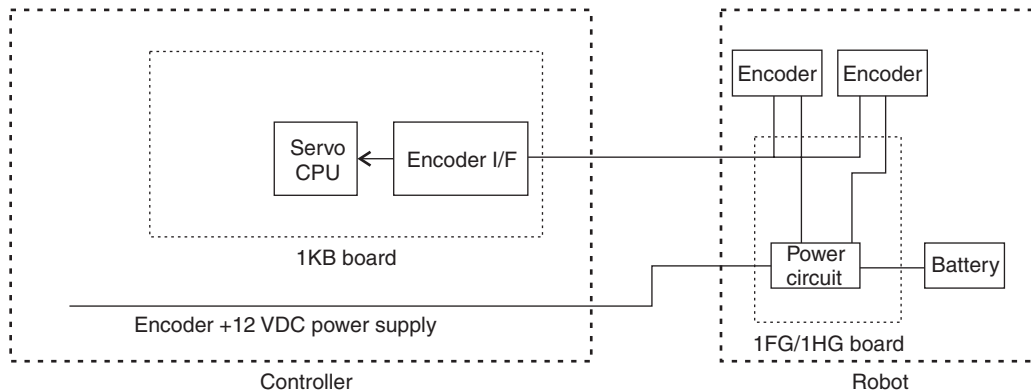
⇒ Check for continuity in the machine harness, separation and signal harness repair or replace as necessary.

**For additional information on error code E1034, see section 1.4.**



**TROUBLESHOOTING****ERROR CODE E1035** Encoder response error (Jt XX).

Occurs when the encoder does not respond, or response is slow, to data request signal from the 1KB board.



Main causes include:

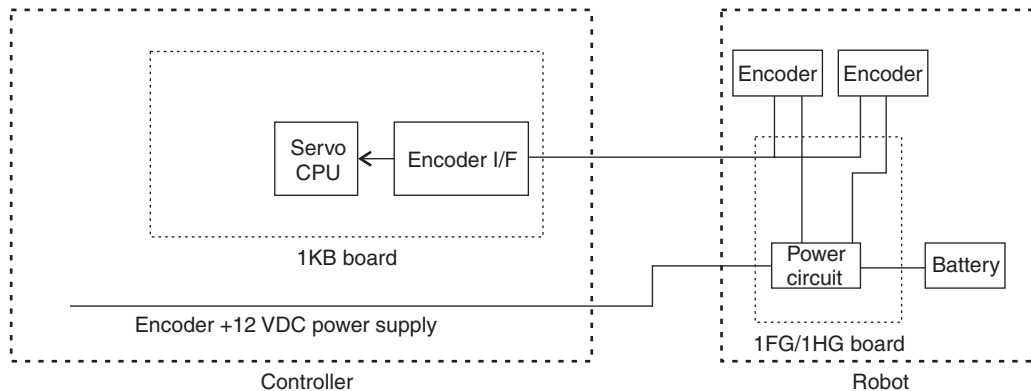
1. Defective encoder or encoder harness.
2. Defective 1KB or 1FG/1HG board.
3. Noise related malfunction.
4. Servo spot weld gun.
  - Loose connection at tool changer.
  - Defective tool changer harness.

- ⇒ Check connections at encoder, 1FG/1HG board, and separation harness.
- ⇒ Ensure the 1KB board is properly seated into the card rack.
- ⇒ Replace encoder, replace 1KB board.
- ⇒ Check for continuity in the machine harness and separation harness.
- ⇒ Replace 1FG/1HG board.
- ⇒ Check for noise malfunction and shield integrity.
- ⇒ Inspect the servo gun and tool changer harnesses; replace as necessary.
- ⇒ After repair is complete, confirm correct program playback in check mode before running program in repeat mode.

**For additional information on error code E1035, see section 1.4.**

**TROUBLESHOOTING****ERROR CODE E1036** Encoder communication error. (Jt XX)

Cyclic redundancy check (CRC) fault or framing error is detected in communication with the encoder.



Main causes include:

1. Noise related malfunction.
2. Defective encoder or encoder harness.
3. Defective 1KB or 1FG/1HG board.
4. Servo spot weld gun.
  - Loose connection at tool changer.
  - Defective tool changer harness.

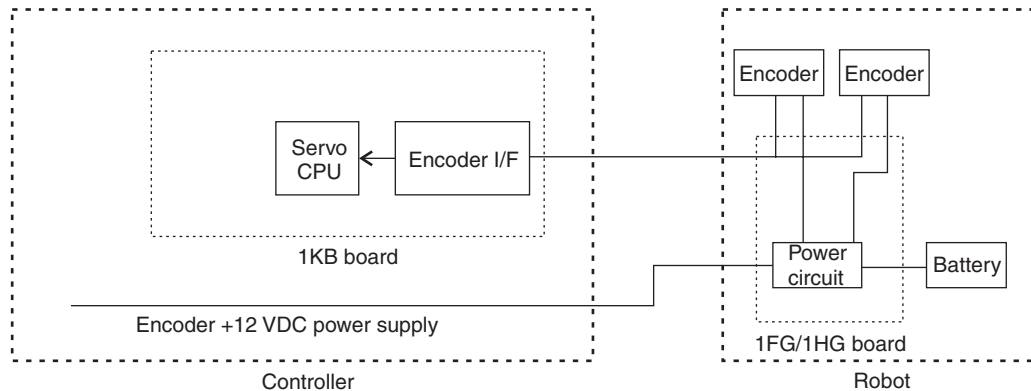
- ⇒ Check for noise malfunction and shield integrity.
- ⇒ Check connections at encoder, 1FG/1HG board, and separation harness.
- ⇒ Ensure the 1KB board is properly seated into the card rack.
- ⇒ Replace encoder, replace 1KB board.
- ⇒ Check for continuity in the machine harness, separation harness and signal harness.
- ⇒ Replace 1FG/1HG board.
- ⇒ Inspect the servo gun and tool changer harnesses; replace as necessary.
- ⇒ After repair is complete, confirm correct program playback in check mode before running program in repeat mode.

**For additional information on error code E1036, see section 1.4.**

**TROUBLESHOOTING**

**ERROR CODE E1037** Encoder data conversion error. (Jt XX).

This error is caused by abnormal encoder absolute position data.



Main causes include:

1. Noise related malfunction.
2. Defective encoder or encoder harness.
3. Defective 1KB or 1FG/1HG board.
4. Servo spot weld gun.
  - Loose connection at tool changer.
  - Defective tool changer harness.

⇒ Check for noise malfunction and shield integrity.

⇒ Replace encoder, replace 1KB board.

⇒ Check connections at encoder, 1FG/1HG board, and separation harness.

⇒ Ensure the 1KB board is properly seated into the card rack.

⇒ Check for continuity in the machine harness and separation harness.

⇒ Replace 1FG/1HG board.

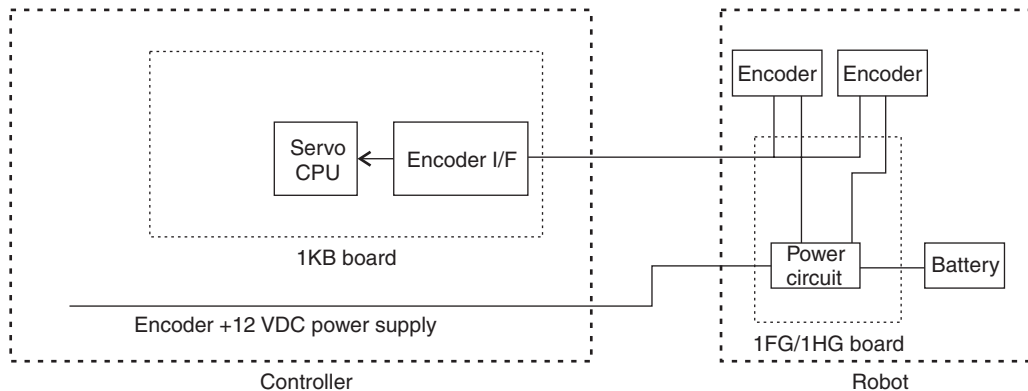
⇒ Inspect the servo gun and tool changer harnesses; replace as necessary.

⇒ After repair is complete, confirm correct program playback in check mode before running program in repeat mode.

**For additional information on error code E1037, see section 1.4.**

**TROUBLESHOOTING****ERROR CODE E1038** Encoder ABS-track error. (Jt XX)

The absolute data and the incremental data in the encoder are different. ABSALM=1 is output from the encoder when this error occurs.



Main causes include:

1. Noise related malfunction.
2. Defective encoder or encoder harness.
3. Defective 1KB or 1FG/1HG board.
4. Servo spot weld gun.
  - Loose connection at tool changer.
  - Defective tool changer harness.

⇒ Check for noise malfunction and shield integrity.

⇒ Replace encoder, replace 1KB board.

⇒ Check connections at encoder, 1FG/1HG board, and separation harness.

⇒ Ensure the 1KB board is properly seated into the card rack.

⇒ Check for continuity in the machine harness and separation harness.

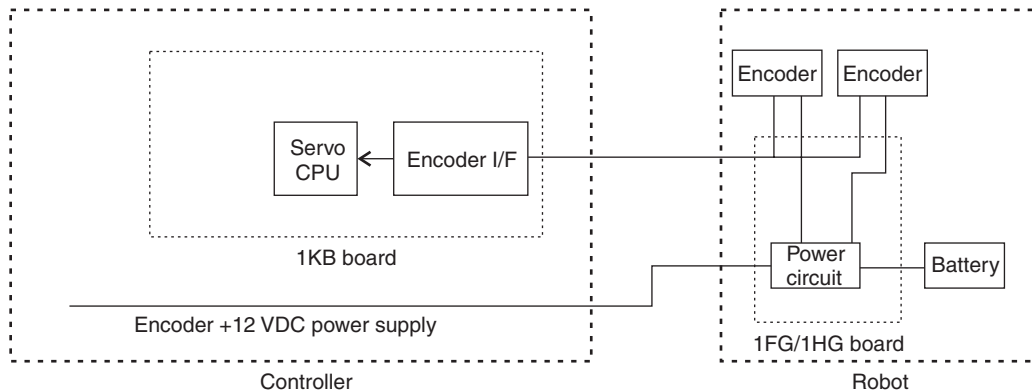
⇒ Replace 1FG/1HG board.

⇒ Inspect the servo gun and tool changer harnesses; replace as necessary.

**For additional information on error code E1038, see section 1.4.**

**TROUBLESHOOTING****ERROR CODE E1039** Encoder INC-pulse error. (Jt XX)

Occurs when the encoder A and B incremental pulses are abnormal. The encoder INALM bit is sent with the serial data=1.



Main causes include:

1. Noise related malfunction.
2. Defective encoder or encoder harness.
3. Defective 1KB or 1FG/1HG board.
4. Servo spot weld gun.
  - Loose connection at tool changer.
  - Defective tool changer harness.

⇒ *Replace encoder, replace 1KB board.*

⇒ *Check connections at encoder, 1FG/1HG board, and separation harness.*

⇒ *Ensure the 1KB board is properly seated into the card rack.*

⇒ *Check for continuity in the machine harness and separation harness.*

⇒ *Replace 1FG/1HG board.*

⇒ *Inspect the servo gun and tool changer harnesses; replace as necessary.*

**For additional information on error code E1039, see section 1.4.**

**ERROR CODE E1040** Encoder MR-sensor error. (Jt XX)

The state of the MR sensor in the encoder does not match with JT ENCODER in one rotation.

⇒ *Replace the encoder or encoder harness.*

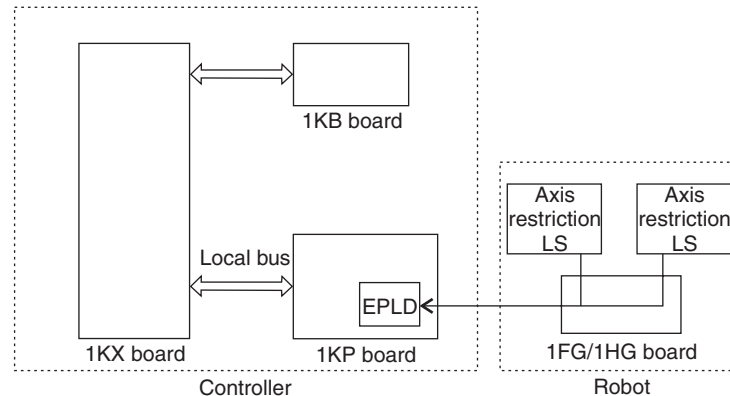
⇒ *Replace signal harness.*

⇒ *Replace 1KB board.*

**TROUBLESHOOTING****ERROR CODE E1041**      Limit switch (JT XX) is ON.

This error occurs when the robot moves beyond the set working range (restricted space) and activates the axis restriction limit switch.

The mechanical stopper and the axis restriction limit switch are optional and the axis they are installed on varies with machine type and configuration.



Main causes include:

1. Software limits are set incorrectly in AUX 0507.
2. Axis is moved using the manual brake release and the limit switch is turned ON.
3. The limit switch is turned ON by overshoot from inertia.
4. Incorrect zeroing data.
5. Defective axis restriction limit switch or signal harness.
6. Defective 1KP board.

⇒ Check the limit switch and limit switch harness; replace as necessary.

⇒ Set the software limits in AUX 0507 to an appropriate value.

⇒ Change the installation angle of the axis restriction limit switch to an appropriate value.

⇒ Replace the 1KP power sequence board.

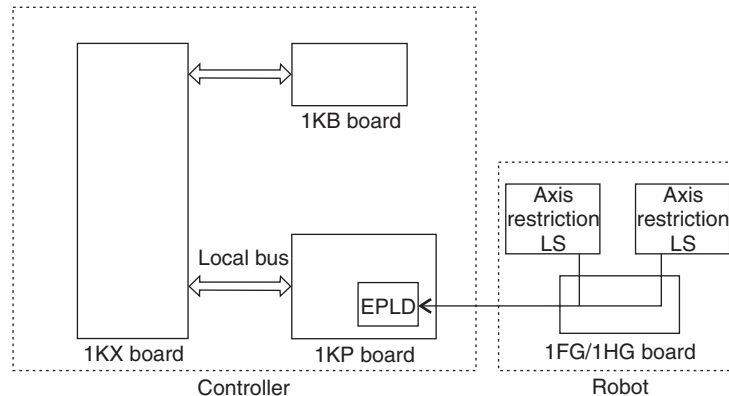
⇒ Return robot within the motion range using the manual brake release or press and hold the overtravel override switch on the 1KP board, reset the error, set motor power ON in teach mode and jog the robot off of the axis restriction limit switch.

**TROUBLESHOOTING**

**ERROR CODE E1042** Limit switch signal line is disconnected.

This error occurs when the axis restriction limit switch is activated and the robot did not move beyond the set working range (restricted space).

The mechanical stopper and the axis restriction limit switch are optional and the axis they are installed on varies with machine type and configuration.



Main causes include:

1. Axis restriction limit switch activated by brake release or unexpected robot motion.
2. Axis restriction limit switch installed inside motion range set in AUX 0507.
3. Incorrect zeroing data.
4. Defective axis restriction limit switch.
5. Defective signal harness.
6. Defective 1KP board.

⇒ Set the software limits in AUX 0507 to an appropriate value.

⇒ Change the installation angle of the axis restriction limit switch to an appropriate value.

⇒ Check harness and limit switch and replace as necessary.

⇒ Replace the 1KP power sequence board.

⇒ Return robot within the motion range using the manual brake release or press and hold the overtravel override switch on the 1KP board, reset the error, set motor power ON in teach mode and jog the robot off of the axis restriction limit switch.

**ERROR CODE E1043** Teach-plug is abnormal.

This error occurs in teach mode if the teach plug is not installed or in repeat mode if the teach plug is connected.

⇒ Ensure the teach-plug is in the proper state for the mode used.

⇒ Check and repair the teach-plug circuit as necessary.

---

## TROUBLESHOOTING

**ERROR CODE E1045** Gun-clamp Mismatch.  
(Spot weld specifications type B)

Spot weld is not selected in AUX 0605-1 when a servo spot weld gun is used.

⇒ *Ensure spot weld is selected in AUX 0605-1.*

---

**ERROR CODE E1046** Too short distance between start point and end point.  
(sensing function)

In a work sensing step, the final end point determined by overrun distance could not be defined because the end point and start point are too close together.

⇒ *Teach the start point far enough from the end point so the final end point can be defined.*

---

**ERROR CODE E1047** Axis number is not for conveyor follow mode.

Main causes include:

1. Setting the conveyor to the same axis number that is assigned to the traverse axis.
2. Changing settings in a specific conveyor tracking mode while in conveyor follow mode.

⇒ *Set the correct axis number for the conveyor axis using the ZCVAXIS command.*

⇒ *Change to the conveyor tracking mode if the robot does have a traverse unit.*

---

**ERROR CODE E1048** Offset data of zeroing is illegal value.

When robot data is loaded the default value of zeroing offset for all axes is 0.

⇒ *Confirm the loaded data is correct.*

---

**ERROR CODE E1049** Current position is out of specified area.  
(Option)

Current values of the robot are not in the specified area at the start of repeat operation.

⇒ *Set CHGMOVE to OFF.*

⇒ *Move the robot inside of the specified area in teach mode.*

---



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## TROUBLESHOOTING

**ERROR CODE E1050** Encoder and brake power off signal not dedicated.

A gun change is executed on a servo spot weld gun without setting [Encoder and brake power (7)] dedicated signal in AUX 0602.

⇒ *From AUX 0602 Dedicated output Signals, set the [Encoder and brake power (7)] signal to dedicated and enter the signal number.*

---

**ERROR CODE E1051** Incorrect double OX output.

When double type signals are used, if either output in the pair is turned ON, the other turns OFF. An instruction to turn both outputs ON, or turn both outputs OFF (OX=1,2 or OX=-1,-2), causes this error.

⇒ *Change the OX signal setting.*  
⇒ *Modify program data.*

---

**ERROR CODE E1052** Work sensing signal is not dedicated.  
(sensing function)

This error occurs when the X-linear step is executed and the dedicated work sensing signal is not detected. When the sensing function is used, a dedicated work sensing signal must be set in AUX 1103.

⇒ *Ensure the work sensing dedicated signal is set properly.*

---

**ERROR CODE E1053** Work sensing signal already input.  
(sensing function)

Main causes include:

1. The X-linear step is executed and the work sensing signal is already on.
2. The sensing start-point is too close to the workpiece.
3. The sensing device or sensing device harness fails.

⇒ *Reteach the start point further away from the workpiece.*  
⇒ *Repair or replace sensing device or sensing device harness.*

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## TROUBLESHOOTING

**ERROR CODE E1054** Cannot execute motion instruction.

Main causes include:

1. A motion instruction is executed for the slave robot during cooperative motion.
2. A motion instruction is executed in soft absorber mode (from SASTART to SAEND).

⇒ *Correct the slave robot program. Only non-motion instructions can be used for the slave robot in the cooperative motion program.*

⇒ *Do not use program motion instructions while in soft absorber mode. Only motion instructions specific to the soft absorber function can be used in soft absorber mode.*

---

**ERROR CODE E1055** Start point position error for circle.

The robot is stopped after it began executing a circular motion and moved 4 mm or more away from its calculated path (jogging or brake slippage, etc.). Attempting to continue execution of the path from this position results in this error.

⇒ *Move the robot closer to the calculated path or restart the program a step prior to the circular path.*

---

**ERROR CODE E1056** MASTER robot already exists.

This error occurs when MASTER instructions are executed for both robots during cooperative motion.

⇒ *One robot must be configured as the MASTER robot and the other robot must be configured as the SLAVE robot.*

---

**ERROR CODE E1057** Check to which robot MASTER/ALONE were instructed.

This error occurs when a robot other than the MASTER robot executes the ALONE, MJMOVE, or MLMOVE instructions.

⇒ *Make program corrections as required.*

---

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## TROUBLESHOOTING

**ERROR CODE E1058** SLAVE robot already exists.

This error occurs when SLAVE instructions are executed for both connected robots during cooperative motion in repeat mode.

⇒ *Do not execute SLAVE instructions for both robots at the same time.*

---

**ERROR CODE E1059** Not an instruction for cooperative motion.

This error occurs when attempting to execute a non-cooperative motion instruction in the MASTER robot program during cooperative motion.

⇒ *Ensure only cooperative motion instructions are used in the MASTER robot program during cooperative motion.*

---

**ERROR CODE E1060** Cannot execute in check back mode.

The program reached an instruction which cannot be executed in check back mode.

Example:

Executing SHIFT instructions in reverse order results in a different path and cannot be done.

⇒ *Execute after selecting a step that can be checked backward. If possible, check forward.*

---

**ERROR CODE E1061** Cannot execute in ONE program.

A motion instruction is specified in the ONE program.

⇒ *Do not program motion instructions in the ONE program.*

⇒ *Refer to the D Series Controller AS Language Reference Manual for proper use of the AS Language commands.*

---

**ERROR CODE E1062** JT2 and JT3 interfere during motion to start pose.

Movement from the current position to the start pose would cause JT2 and JT3 to move beyond their limits.

⇒ *Modify the position of the start pose of the program.*

---

---

## TROUBLESHOOTING

**ERROR CODE E1063** JT2 and JT3 interfere during motion to end pose.

Movement from the current position to the end pose would cause JT2 and JT3 to move beyond their limits.

⇒ *Modify the position of the end pose of the program.*

---

**ERROR CODE E1064** Illegal pallet number.

This error occurs when a pallet number other than 1-9 is used with the PALUP instruction, or the PALLET function.

⇒ *Ensure pallet number 1–9 is used.*

---

**ERROR CODE E1065** Illegal material number.

This error occurs when the work (part) number in a block step program instruction or the pallet function is other than 1–999.

⇒ *Ensure the work number is 1–999.*

---

**ERROR CODE E1066** Illegal pattern number.

Main causes include:

1. Program step does not comply with AS Language syntax.
2. Pattern number for work specified, using block step instructions or the PALLET function, is not between 1 and 5.

⇒ *Refer to the D Series Controller AS Language Reference Manual for proper use of the AS Language commands.*

⇒ *Ensure the work pattern number specified is correct.*

---

---

## TROUBLESHOOTING

### **ERROR CODE E1067**      Illegal pattern type.

Main causes include:

1. Program step does not comply with AS Language syntax.
2. Pattern type for work specified using block step instructions or the PALLET function is not between 1 and 5.

⇒ *Refer to the D Series Controller AS Language Reference Manual for proper use of the AS Language commands.*

⇒ *Ensure the work pattern number specified is correct.*

---

### **ERROR CODE E1068**      Illegal work data.

Main causes include:

1. Program step does not comply with AS Language syntax.
2. Work data specified using block step instructions or the PALLET function is incorrect or not registered.

⇒ *Refer to the D Series Controller AS Language Reference Manual for proper use of the AS Language commands.*

⇒ *Ensure the work data specified is correct.*

---

### **ERROR CODE E1069**      Illegal pallet data.

Main caused include:

1. Program step does not comply with AS Language syntax.
2. Pallet data in a block step program, the PALUP instruction or the PALLET function, is incorrect or not registered.

⇒ *Refer to the D Series Controller AS Language Reference Manual for proper use of the AS Language commands.*

⇒ *Ensure the pallet data specified is correct.*

---

### **ERROR CODE E1070**      ON/ONI signal is already input.

An ON/ONI instruction mode “/ERR” is specified and the signal condition to monitor is already attained when monitoring starts.

⇒ *Delete the “/ERR” mode from the ON/ONI instruction or specify “/LVL” mode.*

⇒ *Modify the program so the signal condition is not attained until monitoring starts.*

---

---

## TROUBLESHOOTING

**ERROR CODE E1071** XMOVE signal is already input.

An XMOVE instruction mode “/ERR” is specified and the signal condition to monitor is already attained when monitoring starts.

- ⇒ Delete the “/ERR” mode from the XMOVE instruction or specify “/LVL” mode.
  - ⇒ Modify the program so the signal condition is not attained until monitoring starts.
- 

**ERROR CODE E1072** Home position data is not defined.

This error occurs when the home position data in AUX 0402 is set to all zeros and the HOME command is executed.

- ⇒ Ensure the data for home position is other than all zeros in AUX 0402.
  - ⇒ If a home position of all zeros is required, set the ZCHECKHOME switch to OFF.
- 

**ERROR CODE E1073** Illegal timer number.

Displayed when a timer is specified other than 1–10.

- ⇒ Specify timers 1–10.
- 

**ERROR CODE E1074** Over maximum signal number.

When the RUNMASK, SIGNAL, BITS, PULSE, or SWAIT commands are used with a signal number that exceeds the range permitted by system configuration, this error is displayed.

- ⇒ Check signal number specified in instruction and ensure it is within system configuration.
- 

**ERROR CODE E1075** Illegal clamp number.

Displayed when the clamp number entered exceeds the maximum permitted by system configuration.

- ⇒ Use only clamp numbers that are supported by system configuration.
-

---

## TROUBLESHOOTING

**ERROR CODE E1076** Cannot use negative time value.

Displayed when a negative number is entered as part of a DELAY or TIMER command.

⇒ *Correct the time setting to a positive number.*

---

**ERROR CODE E1077** No value set.

Occurs when an instruction like the BITS command is evaluated and there is no corresponding value set.

⇒ *Correct program code to evaluate existing values.*

---

**ERROR CODE E1078** Illegal signal number.

This error is displayed when the RUNMASK, SIGNAL, BITS, PULSE, or SWAIT commands are used with a signal number that exceeds the range permitted by system configuration.

⇒ *Check signal number specified in the instruction and ensure it is within system configuration.*

---

**ERROR CODE E1079** Cannot use dedicated signal.

Occurs when a previously dedicated signal is used as a general purpose signal.

⇒ *Use signals that have not been dedicated for specific functions.*

---

**ERROR CODE E1080** Not RPS mode.

Main causes include:

1. External program reset signal is received, but RPS ON signal, or external program input signal is not dedicated.
2. JUMP is taught in a block step program, but external program input signal is not dedicated.
3. END is taught in a block step program, but the RPS ON signal is not dedicated.
4. EXTCALL is executed, but the signal for external program input is not dedicated.

⇒ *Correct the program data.*

⇒ *If RPS is to be used the necessary signals must be dedicated.*

---

---

## TROUBLESHOOTING

**ERROR CODE E1081** Cannot use negative value.

Displayed when a negative number is used in conjunction with the PULSE or ACCURACY commands/instructions.

⇒ *Use only positive numbers in the acceptable range for the PULSE and ACCURACY commands/instructions.*

---

**ERROR CODE E1082** Out of absolute lower motion range limit.

Displayed when an attempt is made to set the software lower limits of robot travel to a value that is beyond the robots lower limit (LLIMIT command).

⇒ *Set lower software travel limits to an acceptable value.*

---

**ERROR CODE E1083** Out of absolute upper motion range limit.

Displayed when an attempt is made to set the software upper limits of robot travel to a value that is beyond the robots upper limit (ULIMIT command).

⇒ *Set upper software travel limits to an acceptable value.*

---

**ERROR CODE E1084** Out of set lower motion range limit.

Data used is beyond the lower limit set in AUX 0507.

Example:

Data used for the SETHOME command is beyond the lower limit set in AUX 0507.

⇒ *Set motion range within the motion range limits set in AUX 0507.*

⇒ *Set lower software travel limits to an acceptable range (confirm safe operation).*

---

**ERROR CODE E1085** Out of user upper limit.

Data used is beyond the upper limit set in AUX 0507.

Example:

Data used for the SETHOME command is beyond the upper limit set in AUX 0507.

⇒ *Set motion range within the motion range limits set in AUX 0507.*

⇒ *Set upper software travel limits to an acceptable range (confirm safe operation).*

---



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## TROUBLESHOOTING

**ERROR CODE E1086** Start point for Jt XX beyond motion range.

Robot pose at motion start is beyond the range set in AUX 0507.

Example:

DO HOME is executed at a point that is out of motion range set in AUX 0507.

⇒ *Correct pose to within working envelope or expand software limits to accept pose.*

---

**ERROR CODE E1087** End location point for Jt XX beyond motion range.

Main causes include:

1. Jt XX at a taught point is beyond the motion range set in AUX 0507.
2. With a servo spot weld gun installed, if a taught point is near the motion range limit for an axis, the robot motion that results from performing tip wear compensation in repeat/check mode causes the robot to exceed the motion range limit.
3. Taught data for the gun axis is out of motion range.

Example:

Taught data is changed from a gun released to a gun connected state without any corresponding change in pose data.

⇒ *Correct pose to within motion range or expand software limits in AUX 0507 to accept pose.*

⇒ *Correct the correct data so that the robot motion is within motion range with the gun connected.*

---

**ERROR CODE E1088** Destination is out of motion range.

While executing a motion to a step, the software calculated the pose destination of all joints to be outside of the allowable upper or lower software limits.

⇒ *Correct pose to within motion range or expand software limits to accept pose.*

---

**ERROR CODE E1089** Cannot do linear motion in current configuration.

System software determined that the start and end points of a linear or circular move will cause the robot to exceed the acceptable motion parameters.

⇒ *Change motion interpolation to a joint move; move the pose to avoid configuration conflict.*

---

---

## TROUBLESHOOTING

**ERROR CODE E1090** External modulation data is not input.  
(Option)

External modulation data is not received.

⇒ *Check for abnormality in the external modulation data line and repair as necessary.*

---

**ERROR CODE E1091** External modulation data is abnormal.  
(Option)

Modulation data is too large.

⇒ *Check for abnormality in the external modulation data line and repair as necessary.*

---

**ERROR CODE E1092** Modulation data is over limit.  
(Option)

Modulation data exceeds the set allowable capacity.

⇒ *Check for abnormality in the external modulation data line and repair as necessary.*

---

**ERROR CODE E1093** Incorrect motion instruction to execute modulate motion.  
(Option)

A non-modulation instruction is specified.

⇒ *Specify appropriate modulation instruction.*

---

**ERROR CODE E1094** Illegal joint number.

Occurs when the DRIVE or other similar command is used and a joint number is specified that is not part of the robot configuration.

⇒ *Confirm robot configuration before using the DRIVE or other similar command.*

---

---

## TROUBLESHOOTING

**ERROR CODE E1095** Cannot execute motion instruction in PC program.

A PC program cannot contain instructions that initiate robot motion.

⇒ *Correct the PC program by removing motion instructions.*

---

**ERROR CODE E1096** Incorrect auxiliary data settings.

The value selected for auxiliary data (speed, timer, tool etc.) exceeds allowable range.

⇒ *Correct the value of auxiliary data.*

⇒ *Perform system initialization.*

⇒ *If correct value is entered and this error recurs, contact KRI customer service.*

---

**ERROR CODE E1097** Missing C1MOVE or C2MOVE instruction.

Program circular motion instructions must have a C1MOVE followed by either a C1MOVE or C2MOVE and end with a C2MOVE.

⇒ *Correct program instructions.*

---

**ERROR CODE E1098** C1MOVE (CIR1) instruction required before C2MOVE.

Program circular motion instructions must have C2MOVE move preceded by a C1MOVE.

⇒ *Correct program instructions.*

---

**ERROR CODE E1099** Unable to create arc path, check positions of the 3 points.

Circular interpolation moves cannot be processed because the points identified are too close together or are on a straight path.

⇒ *Correct program instructions.*

---

## TROUBLESHOOTING

**ERROR CODE E1100** Cannot execute in sealing specification.

Occurs when a CLOSE(I), OPEN(I), or RELAX(I) command is executed in a program and clamp specifications in AUX 0605-1 are set for sealing.

⇒ *Correct program instructions to match software configuration.*

---

**ERROR CODE E1101** Can only execute in sealing specification.

Occurs when a GUNON, GUNOFF, GUNONTIME or GUNOFFTIME command is executed in a program and clamp specifications in AUX 0605-1 are not set for sealing.

⇒ *Correct program instructions to match software configuration.*

---

**ERROR CODE E1102** Option is not set, cannot execute.  
(Option)

A command/instruction is executed for an option that is not installed and/or set up.

Example:

An attempt to save/load data to/from a floppy disk is made, but a floppy disk drive is not installed and/or set up.

⇒ *Ensure the option is installed and software is set up properly.*

⇒ *To install an option that is not included in the original controller specifications contact KRI customer service.*

---

**ERROR CODE E1103** Over conveyor position  
(Option)

The value of the conveyor axis exceeds the set motion area limit.

⇒ *Set the conveyor axis value to a value less than the maximum value.*

---

**ERROR CODE E1104** Too many SPINMOVE instructions.

This error occurs when the SPINMOVE instruction is used in 17 or more consecutive steps.

⇒ *Correct the SPINMOVE program instruction to 16 or less consecutive steps in the program between spin start and spin stop.*

---

---

## TROUBLESHOOTING

**ERROR CODE E1106** Cannot execute in this robot.

This error occurs when a request is executed on a robot arm that does not support the function.

⇒ *Contact KRI customer service to have the function installed or delete the request.*

---

**ERROR CODE E1108** Duplicate robot network IDs.

With the robot network installed and operational, the same ID number is assigned to two different robots connected to the network.

⇒ *Change the robot ID using the ROBNETID command.*

---

**ERROR CODE E1109** Conveyor I/F board is not installed.

1JS board is not installed for interface with an incremental-type conveyor encoder.

1. 1JS board not installed to the 1GW/1HW board.
2. Defective 1JS board.
3. The 1JS board is installed onto a defective 1GW/1HW board.

⇒ *Ensure the 1JS board is properly installed.*

⇒ *Replace the 1JS board.*

⇒ *Replace the 1JS board and the 1GW/1HW board.*

---

**ERROR CODE E1110** GROUP is not primed.

The GROUP instruction is not programmed before a motion instruction, with external axis system.

⇒ *This error occurs if the program is interrupted after a GROUP instruction and before the motion commands pertaining to the GROUP instruction are complete. When restarting the program prime the program before the GROUP instruction.*

⇒ *In check mode, if the GROUP instruction is used, start checking before the GROUP instruction.*

---

---

## TROUBLESHOOTING

**ERROR CODE E1113**      Work sensing signal is not detected.  
(sensing function)

This error occurs when the X-linear step is executed and the workpiece is not detected before the robot axes reach coincidence of the taught point.  
The sensing device or sensing device harness may be defective.

⇒ *Set the accuracy range to a smaller value.*  
⇒ *Repair or replace sensing device or sensing device harness.*

---

**ERROR CODE E1114**      Interruption in cooperative control.

This error occurs when an error condition is generated for one robot during cooperative motion in repeat mode operation.

⇒ *Repair the cause of the interruption and reset the error.*

---

**ERROR CODE E1115**      Force termination of cooperative control.

The program ended without executing the ALONE instruction in either the MASTER or the SLAVE robot program. Both robots are stopped and cooperative motion is released.

⇒ *Insert the ALONE instruction in either the MASTER or the SLAVE robot program.*

---

**ERROR CODE E1116**      Spin axis is not stopped on every 360 degrees.

During spin, the robot or spin axis is stopped and the current pose is taught with the JT6 spin axis stopped at a position other than 0 degrees.

Main causes include:

1. EMERGENCY STOP switch is pressed.
2. HOLD/RUN switch is set to HOLD.
3. TEACH/REPEAT switch is set to TEACH.

⇒ *Execute SPINRESET to correct the rotation angle of the JT6 spin axis to stop in 360 degree units.*

---

---

## TROUBLESHOOTING

**ERROR CODE E1117** Process time over.

Lack of system processing time

⇒ *Contact KRI customer service (include operating conditions/settings and operation log at the time the error occurred).*

---

**ERROR CODE E1118** Command value for Jt XX suddenly changed.

### Spot Welding and Material Handling

In the repeat mode, the commanded position of the joint identified exceeds the limit value. In the check mode, the commanded position of the joint identified exceeds the speed limit value.

- ⇒ *Check for singularity condition during robot motion and reteach to correct.*
- ⇒ *Check for loose or defective servo system encoders, harnesses, and circuit boards.*
- ⇒ *Replace 1KB board.*
- ⇒ *Replace power block.*

### Servo Spot Weld Gun

Occurs when corrections for deflection cause movement of the robot to exceed the range of motion of one or more axes. This condition is not limited to the gun axis; any axis, including the gun axis, can cause this error.

- ⇒ *Change the posture of the robot.*
  - ⇒ *Decrease the speed in the step.*
  - ⇒ *Reduce the amount of the deflection correction in the step by using AS Language SGREFLEX command (check conditions during pressurizing).*
  - ⇒ *Reteach the point and change the configuration of the posture of the robot if needed.*
-

## TROUBLESHOOTING

**ERROR CODE E1119**      Commanded value for Jt XX beyond motion range.

### Spot Welding and Material Handling

The commanded position for the joint identified exceeds the software limits. Condition is monitored in both the check and repeat modes.

⇒ *Correct taught positions to avoid the software limits.*

⇒ *Adjust the software limits in AUX 0507 to provide the necessary motion range.*

### Servo Spot Weld Gun

If a taught point is near a servo gun or arm axis range of motion limit, the combination of tip wear and deflection correction can prevent the robot from reaching the taught point.

⇒ *Do not teach points that are near axes range of motion limits.*

---

**ERROR CODE E1120**      Current command causes interference betw Jt2 and Jt3.

A posture is attempted which causes Jt2 and Jt3 to interfere with each other.

⇒ *Change the taught poses.*

---

**ERROR CODE E1121**      Other robot is in the interference area.

This error occurs when the zone interference signal is not received.

⇒ *Ensure the zone interference signal is set-up correctly and the program is written correctly.*

---



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## TROUBLESHOOTING

### **ERROR CODE E1122** Unexpected motor power OFF.

Occurs when software turns motor power ON (K1 or K2 contactors ON) but there is no signal feedback (MCON) indicating motor power is ON.

Main causes include:

1. Defect in the 1KP power sequence board.
2. Defect in the 1KQ/1NQ relay board.
3. Malfunction in the error detection circuit and error processing of 1KP/1KQ board.
4. Auxiliary contact of magnet contactor (K1, K2) for motor power is defective.
5. Malfunction with the servo software or the AS software.
6. Defect in the harnesses between 1KQ-CN3 and K1/K2.

⇒ *Reinstall AS/servo software.*

⇒ *Replace the 1KP power sequence board.*

⇒ *Replace the 1KQ/1NQ relay board.*

⇒ *Replace the magnetic contactor (K1, K2).*

⇒ *Repair or replace the harnesses between 1KQ-CN3 and K1/K2.*

⇒ *Replace the MC unit.*

---

### **ERROR CODE E1123** Speed error Jt XX.

Joint speed (motor speed) calculated using encoder values exceeds the rated value.

Main causes include:

1. Disconnected motor power line U, V, and/or W phase, or defective power block.
2. Wiring error in motor power line and/or encoder line.
3. Disconnected encoder signal line, short circuit in encoder or encoder wiring, and/or defective main body of the encoder.
4. Robot motion program causes a singularity.
5. Defective 1KB servo board and/or power block.
6. Moment of inertia exceeded the motor torque.

⇒ *Reduce payload to the specified ratings.*

⇒ *Check for disconnection, short circuit, and proper wiring for the U, V, and W motor power line.*

⇒ *Replace the encoder and/or encoder harness as necessary.*

⇒ *Replace the 1KB board.*

⇒ *Replace the power block.*

⇒ *Rewrite program data such as speed and pose in the case of singularity motion.*

---

## TROUBLESHOOTING

**ERROR CODE E1124**      Deviation error of Jt XX.

### Spot Welding and Material Handling

The difference between the current value from the encoder and the command value in the AS software exceeds the regulated value (varies by robot model).

Main causes include or the following abnormalities:

#### Mechanical -

1. Singularity motion.
2. The robot arm has contacted an external item hindering movement.
3. The harness is caught in the robot arm.
4. The cyclo reduction unit, the gear, or the bearing are damaged.
5. Cyclo reduction unit gear backlash is too narrow.
6. Payload weight exceeds robot specifications for capacity.
7. Robot motion pattern exceeds ratings of the motor.
8. Motor brake is not released.

#### Electrical-

1. Motor power line U, V, and W phase are disconnected.
2. The brake line is disconnected or brake drive circuit is damaged.
3. Defective 1KQ/1NR board.
4. The power block is damaged.
5. Defective 1KB servo board.
6. Malfunction of the motor.

⇒ *Check the cyclo reduction unit, etc. for mechanical failure. Replace as necessary.*

⇒ *Re-teach robot motion as necessary.*

⇒ *Check the harnesses and power block unit for electrical malfunctions and replace as necessary.*

⇒ *Replace the 1KB board.*

⇒ *Replace the 1KQ/1NR board.*

⇒ *Correct the teach data in case of singularity motion.*

### Servo Spot Weld Gun

The thickness of the workpiece at the weld point is greater than the thickness when the point is taught. The thickness difference required to set this error is approximately 10 mm, depending on the gun type.

⇒ *Inspect the workpiece; replace it if necessary.*

---

## TROUBLESHOOTING

### **ERROR CODE E1126**      Commanded speed error Jt XX.

This error occurs when the positional command value sent to the 1KB board from the 1KA board exceeds the value range.

Main causes include:

1. A sudden change in robot motion.
2. Defective 1KA/1KB board.
3. Corrupt AS software caused the commanded speed value to exceed motor capacity rating.

⇒ *Modify program data to eliminate sudden changes in robot motion.*

⇒ *Replace the 1KB board.*

⇒ *Replace the 1KA board.*

⇒ *Replace the 1KX board (motherboard).*

⇒ *Reload software for the 1KB board and/or 1KA board.*

---

### **ERROR CODE E1127**      Command acceleration error Jt XX.

This error occurs when the amount of change in the speed value, sent to the 1KB board from the 1KA board, exceeds the value range.

Main causes include:

1. Sudden change in robot motion.
2. Defective 1KA/1KB board.
3. Corrupt AS software caused the commanded acceleration value to exceed motor capacity rating.

⇒ *Modify program data to eliminate sudden changes in robot motion.*

⇒ *Replace the 1KB board.*

⇒ *Replace the 1KA board.*

⇒ *Replace the 1KX board (motherboard).*

⇒ *Reload software for the 1KB board and/or 1KA board.*

---

---

## TROUBLESHOOTING

**ERROR CODE E1128**      Uncoincidence error betw destination and current Jt XX pos.

This error occurs during program execution, if all joints do not reach total coincidence within the commanded accuracy and time.

Main causes include.

Mechanical-

1. Damaged bearings.
2. Insufficient gear backlash.
3. Motor brake not released.
4. Arm movement restricted by harnesses or peripheral devices.

Electrical-

1. Motor power line U, V, and W phase are disconnected.
2. Defective 1KB servo board.
3. Defective 1KQ/1NR board (malfunction in the brake circuit).
3. Defective power block.
4. Disconnected motor power or brake lines.
5. Defective encoder or encoder harness.

Program data-

1. The difference in the angle of the wrist at the start and end steps is too great.  
Example: 180 degrees at the start step and -180 degrees at the end step.

⇒ *Repair mechanical or electrical failures as necessary.*

⇒ *Check interference from external devices.*

⇒ *Modify taught wrist positions as required.*

---

**ERROR CODE E1129**      Jt XX is moved during regulation of external axis.  
(External axis restriction function)

This error occurs when an attempt is made to move the robot in teach or repeat mode while the external axis restriction signal is present.

⇒ *Ensure the internal interlock circuit is operating normally.*

⇒ *Ensure the robot program is written correctly.*

---

## TROUBLESHOOTING

**ERROR CODE E1130** Jt XX collision was detected.

Motor current command value exceeds the threshold value set in AUX 0510.

- ⇒ *Remove obstacles in the robot motion path area.*
  - ⇒ *Ensure tool settings are correct.*
  - ⇒ *If an obstacle was not encountered, increase the threshold value set in AUX 0510.*
- 

**ERROR CODE E1131** Jt XX Unexpected shock is detected.

Change in motor current command value, per unit of time, exceeds the threshold value set in AUX 0510.

- ⇒ *Remove obstacles in the robot motion path area.*
  - ⇒ *Ensure tool settings are correct.*
  - ⇒ *If an obstacle was not encountered, increase the threshold value set in AUX 0510.*
- 

**ERROR CODE E1132** Motor power OFF. Measurement stopped.

This error occurs when motor power is interrupted during auto load measurement.

Main causes include:

1. External HOLD/RUN switch is set to HOLD.
2. TEACH/REPEAT switch is set to TEACH.
3. External EMERGENCY STOP switch is pressed.

- ⇒ *Reset switches to allow repeat operation. Repeat the auto load measurement.*
  - ⇒ *Ensure the motor power is not interrupted during auto load measurement. Repeat the auto load measurement.*
- 

**ERROR CODE E1133** Conveyor has reached max. value position.

The conveyor exceeded the maximum value set for the conveyor during program execution.

- ⇒ *Ensure conveyor maximum value is set correctly.*
  - ⇒ *Modify program data as necessary.*
-

---

## TROUBLESHOOTING

### **ERROR CODE E1134**      Abnormal work transfer pitch.

The signal for resetting the conveyor value is received before the conveyor reached the position specified by the work transfer pitch.

- ⇒ *Ensure the work transfer pitch is set correctly.*
  - ⇒ *Modify program data as necessary.*
- 

### **ERROR CODE E1135**      Motor power OFF.

Displayed whenever an emergency stop is encountered.

Main causes include:

1. External EMERGENCY STOP switch is pressed.
2. Teach pendant or operation panel EMERGENCY STOP switch is pressed.
3. Emergency stop line is disconnected.

- ⇒ *Reset emergency stop button and reapply motor power.*
  - ⇒ *Repair emergency stop line as necessary.*
- 

### **ERROR CODE E1136**      Standard terminal is not connected.

A PRINT, TYPE, or PROMPT command is specified for display on a PC that is not connected.

- ⇒ *Verify the PC connections and set-up, or modify, the commands for display on the teach pendant.*
- 

### **ERROR CODE E1137**      Cannot input/output to teach pendant.

Main causes include:

1. A PRINT, TYPE, or PROMPT command is specified for display on the teach pendant, and a teach pendant connection is not present.
2. Incorrect setting for teach pendant connection.
3. Controller is unable to switch to the teach pendant keyboard screen in its current state.

- ⇒ *Verify the teach pendant connections and set-up, or modify, the commands for display on the PC.*
  - ⇒ *Reset the teach pendant so switching to the keyboard screen is possible.*
-

---

## TROUBLESHOOTING

**ERROR CODE E1138** Aux. terminal is not connected.

External monitoring device is not connected.

⇒ *Ensure the external monitoring device is properly connected.*

---

**ERROR CODE E1139** DA board is not installed.  
(Option, analog voltage output)

Main causes include:

1. The optional I/O board for analog output is not installed or is defective (1GW/1HW with analog output option).
2. The signal number used is not in the range of usable signal numbers set using the SETOUTSIG command/instruction.

⇒ *Install or replace the optional I/O board for analog output (1GW/1HW with analog output option).*

⇒ *Ensure the signal number used is in the range of usable signal numbers set using the SETOUTSIG command/instruction.*

---

**ERROR CODE E1140** There is no conveyor axis.

Conveyor synchronous function is set-up but a conveyor axis is not installed.

⇒ *Change the settings or install the conveyor axis.*

---

**ERROR CODE E1141** Conveyor transfers beyond sync. zone.

During synchronous motion the conveyor transferred beyond the synchronous zone set using the CVWAIT instruction.

⇒ *Ensure the synchronous zone set using the CVWAIT instruction is correct.*

---

**ERROR CODE E1142** No traverse axis.

Conveyor follow mode is set-up but a traverse axis is not installed.

⇒ *Ensure conveyor tracking mode is properly set-up.*

⇒ *Install a traverse axis.*

---

---

## TROUBLESHOOTING

**ERROR CODE E1143** Conveyor axis number is not set.

Conveyor axis number is not set at execution of conveyor synchronous motion.

⇒ *Set the conveyor axis number using the ZCVAXIS instruction.*

---

**ERROR CODE E1144** No arm control board.

⇒ *Ensure the 1KB arm control board is properly installed.*

⇒ *Replace the 1KB board.*

⇒ *Replace the 1KA board.*

---

**ERROR CODE E1145** Cannot use specified channel, already in use.

Several “WHERE” commands were executed at the same time.

⇒ *Do not execute unnecessary “WHERE” commands.*

---

**ERROR CODE E1146** [LESQ] Aborted by process time over.

KLogic program did not complete execution within the specified time.

⇒ *Contact KRI customer service (include operating conditions/settings and operation log at the time the error occurred).*

---

**ERROR CODE E1147** Cannot open setting file, so cannot set to shipment state.

When “2: Setting to shipment state” is selected from the initialization screen, there is no setting file (ini\_load.cmd) in the 1KA board memory.

⇒ *Load the setting file (ini\_load.cmd) into the 1KA board memory.*

---

**ERROR CODE E1148** Cannot read setting file, so cannot set to shipment state.

When “2: Setting to shipment state” is selected from the initialization screen, the setting file (ini\_load.cmd) in the 1KA board memory could not be decoded.

⇒ *Ensure the proper setting file (ini\_load.cmd) is loaded into the 1KA board memory.*

---



---

## TROUBLESHOOTING

**ERROR CODE E1149** Cannot open setting data, so cannot set to shipment state.

When “2: Setting to shipment state” is selected from the initialization screen, a data file in the setting file (ini\_load.cmd) in the 1KA board memory could not be opened.

⇒ *Ensure the proper setting file (ini\_load.cmd) is loaded into the 1KA board memory.*

---

**ERROR CODE E1150** Cannot read setting data, so cannot set to shipment state.

When “2: Setting to shipment state” is selected from the initialization screen, a data file in the setting file (ini\_load.cmd) in the 1KA board memory could not be decoded.

⇒ *Ensure the proper setting file (ini\_load.cmd) is loaded into the 1KA board memory.*

⇒ *If the proper setting file (ini\_load.cmd) is loaded replace the 1KA board.*

---

**ERROR CODE E1151** Too much data for setting to the shipment state.

When “2: Setting to shipment state” is selected from the initialization screen, more than 10 data files are in the setting file (ini\_load.cmd) in the 1KA board memory.

⇒ *Ensure 10 or less data files are in the setting file (ini\_load.cmd) loaded into the 1KA board memory.*

---

**ERROR CODE E1152** Name of setting data for shipment state is too long.

When “2: Setting to shipment state” is selected from the initialization screen, the name of a data file in the setting file (ini\_load.cmd) in the 1KA board memory exceeds eight characters, or the file extension exceeds four characters.

⇒ *Ensure the file name and extension contains the proper number of characters.*

---

**ERROR CODE E1153** Power sequence board detects error. (Code=XX)

An error is detected by the 1KP board but the code (Code=XX) could not be interpreted by the AS software.

⇒ *Replace the 1KP board.*

⇒ *If this error recurs after replacing the 1KP board contact KRI customer service.*

---

---

## TROUBLESHOOTING

**ERROR CODE E1154**      Option SIO port is not installed.

Main causes include:

1. Optional communication port (1GS board) is not installed to the 1KA board.
2. Optional communication port (1GS board) is not recognized by the 1KA board.

⇒ *Install the optional communication port (1GS board) onto the 1KA board.*

⇒ *Replace the 1KA board.*

---

**ERROR CODE E1155**      A/D converter is not installed.

A/D converter board (1FH) is not installed to the 1KA board.

⇒ *Install the A/D converter board (1FH).*

---

**ERROR CODE E1156**      [ARM CONTROL BOARD] Processing time over.

AS software processing did not complete within normal time.

⇒ *Reset the error.*

⇒ *If this error recurs, contact KRI customer service.*

---

---

**TROUBLESHOOTING****ERROR CODE E1157** Arm ID I/F board error. (code XXX)

Code	Description
<b>C1H</b>	Communication check sum error <sup>1</sup>
<b>C5H</b>	Communication protocol error <sup>1</sup>
<b>C6H</b>	Communication response time-out error <sup>1</sup>
<b>FFH</b>	Other errors (unknown error) <sup>2</sup>

<sup>1</sup>Damaged or disconnected communication cable.<sup>2</sup>F\*H cycle controller power ON and OFF. If error does not clear further diagnosis is needed (possible damaged arm ID board or power sequence board).

Main causes include:

1. Defective 1GV/1KA/1KB/1KP boards.
2. Defective controller harness, separate harness, and/or machine harness.

*⇒ Replace 1GV/1KA/1KB/1KP boards.**⇒ Replace controller harness, separate harness, and/or machine harness.*

---

**ERROR CODE E1158** (SSCNET) Servo error of Jt XX.

Alarm or warning detected in the Mitsubishi servo amplifier or servo motor.

*⇒ Refer to the message displayed after the error message.*

---

**ERROR CODE E1159** (SSCNET) Error code for servo is (XX).

Alarm or warning detected in the Mitsubishi servo amplifier or servo motor.

*⇒ Refer to the Mitsubishi servo amplifier instruction manual for troubleshooting.*

---

**ERROR CODE E1160** (SSCNET) Servo error and monitor setting error of Jt XX.

Alarm or warning detected in the Mitsubishi servo amplifier or servo motor, but alarm and warning is not set to be monitored and displayed.

*⇒ Set the alarm and warning to be monitored, and refer to the messaged displayed for troubleshooting.*

---

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## TROUBLESHOOTING

**ERROR CODE E1162** Buffer overflow occurred gravity comp. value channel XX.

Gravity compensation value overflow due to mismatch of load weight and the set value.

⇒ *Contact KRI customer service (include operating conditions/settings and operation log at the time the error occurred).*

---

**ERROR CODE E1163** Robot stopped in checking operational area.

The robot stopped during auto load measurement and is unable to continue the operation.

⇒ *Repair the cause of the robot stopping and re-execute auto load measurement.*

---

**ERROR CODE E1164** [LSEQ] Program execution error in at control power ON.  
(code XX)

Controller power is set OFF during KLogic program execution and the program did not re-execute automatically at the next controller power-up.

⇒ *Display the contents of the error message number displayed after the code (sub-code XX) using the \$ERROR function.*  
Example: TYPE \$ERROR (-11038)

---

**ERROR CODE E1165** Unable to download ext. axis parameter. (Jt-A)

Download failed due to channel 7 parameter being downloaded by another process.

⇒ *Re-execute parameter download.*  
⇒ *If this error recurs, contact KRI customer service.*

---

**ERROR CODE E1166** Num. not assigned to specified channel. (Jt-A)

Channel is not assigned an axis number.

⇒ *Assign an axis number to channel 7.*

---

---

**TROUBLESHOOTING**

**ERROR CODE E1167**      Unable to download ext. axis parameter. (Jt-B)

Download failed due to channel 8 parameter is being downloaded by another process.

⇒ *Re-execute parameter download.*

⇒ *If this error recurs, contact KRI customer service.*

---

**ERROR CODE E1168**      Num. not assigned to specified channel. (Jt-B)

Channel is not assigned an axis number.

⇒ *Assign an axis number to channel 8.*

---

**ERROR CODE E1169**      Error in servo parameter change sequence. (code XX)

Servo parameters upload/download requested but completion is not confirmed.

Code	Description
<b>A</b>	Unit number normally 0.
<b>B</b>	Channel number. 0 is the first channel on the 1KB board and is normally JT1.
<b>C</b>	Group number. Servo parameters are in two parts.
<b>D</b>	Sequence status
<b>F</b>	Initialize:0, normal:, 1 upload request: 2, waiting upload:3, download request:4, waiting download:5, end process: 6.

⇒ *Reset error.*

⇒ *If error cannot be reset, cycle controller power OFF and ON.*

---

---

## TROUBLESHOOTING

### **ERROR CODE E4000**      Data communication error.

Main causes include:

1. When receiving data from vision sensor:
  - Time out occurred, data is not received within the specified time.
  - Robot is stopped by HOLD, ABORT or PCABORT during data communication.
  - Robot stopped by the CONTROL key or ENTER key from a PC keyboard during data communication
2. During Host Communication I, data is not received within the specified time after ENQ code is sent.
3. Communication error occurred during PC terminal, floppy disk, or PC card interaction with the AS software.

⇒ *Check communication line, and re-execute.*

⇒ *Ensure communication protocol used for Host Communication I is correct.*

⇒ *Check the communication cable, and replace as necessary.*

---

### **ERROR CODE E4001**      Data reading error.

Discrepancy in data between when it is written to a PC terminal, floppy disk or PC card and when it is read back from the storage media for verification.

⇒ *Re-execute data reading.*

⇒ *If this error recurs, replace the storage media, 1KA/1KF boards, harness, etc.*

---

### **ERROR CODE E4002**      Data transfer error.

Error occurred during data writing to a PC terminal, floppy disk or PC card.

⇒ *Re-execute data writing.*

⇒ *If this error recurs, replace the storage media, 1KA/1KF boards, harness, etc.*

---

### **ERROR CODE E4003**      Unexpected error in file access.

During floppy disk or PC card interaction with the AS software, an undefined communication error occurred.

⇒ *Re-execute file access.*

⇒ *If this error recurs, replace the storage media, 1KA/1KF boards, harness, etc.*

---

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## TROUBLESHOOTING

**ERROR CODE E4004**      Communication retry error.

Communication retry error during Host Communication I.

Main causes include:

1. No response after sending text.
2. After text is sent, NAK (resend request) exceeded the allowed number of retries.

⇒ *Ensure communication protocol used for Host Communication I is correct.*

⇒ *Check the communication cable and replace as necessary.*

---

**ERROR CODE E4005**      Communication process was stopped.

During Host Communication I, a stop monitor command (ABORT, PCABORT, etc.) is executed during execution of SEND/RECEIVE.

⇒ *Re-execute the EXECUTE, PCEXECUTE, etc. command.*

---

**ERROR CODE E4006**      Receive no data after request.

During Host Communication I, text data is not received within the allowed time after the data request is sent.

⇒ *Ensure communication protocol used for Host Communication I is correct.*

⇒ *Check the communication cable and replace as necessary.*

---

**ERROR CODE E4007**      Receiving data is too long (MAX=255 character).

During Host Communication I, an attempt to receive a string with more than 255 characters is made.

⇒ *Ensure communication protocol used for Host Communication I is correct.*

---

**ERROR CODE E4008**      Abnormal data (EOT) received in communication.

During Host Communication I, abnormal code (EOT) is received and the communication process is stopped.

⇒ *Ensure communication protocol used for Host Communication I is correct.*

---

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## TROUBLESHOOTING

**ERROR CODE E4009**      Communication time out error.

During Host Communication I or TCP/IP interface, data is not received within the allowed time after executing the RECEIVE instruction.

- ⇒ *Ensure communication protocol used for Host Communication I is correct.*
  - ⇒ *Reserve the communication line.*
- 

**ERROR CODE E4010**      Terminal already in use.

The prompt instruction is executed by two or more programs at the same time.

- ⇒ *Do not execute the prompt instruction from two or more programs at the same time.*
- 

**ERROR CODE E4011**      Communication port already in use.

During Host Communication I, TERMON is executed from the teach pendant keyboard screen while the PC terminal port is in use.

- ⇒ *Ensure the PC terminal port is not in use before execution of TERMON from the teach pendant keyboard screen.*
- 

**ERROR CODE E4012**      Waiting for input of PROMPT. Connect input device.

The input device specified by a prompt command, i.e., PC or teach pendant, is not connected.

- ⇒ *Ensure the specified device is connected.*
- 

**ERROR CODE E4013**      TELNET) SEND error. CODE=XX.

This error occurs when data is transmitted by TCP/IP, and an abnormality occurs in the communication line or the connection is aborted or closed.

- ⇒ *Check the communication line to the target end node and repair as necessary.*
  - ⇒ *Check for problems at the target end node and repair as necessary.*
  - ⇒ *The sub-error code (CODE=XX) is generated by the TCP/IP package. Refer to the TCP/IP package manual.*
-



## TROUBLESHOOTING

### **ERROR CODE E4014** TELNET) RECV error. CODE=XX.

During TCP/IP communication, data is not received due to a RECV (receive) error.

- ⇒ Check the communication line to the target end node and repair as necessary.
  - ⇒ Check for problems at the target end node and repair as necessary.
  - ⇒ The sub-error code (CODE=XX) is generated by the TCP/IP package. Refer to the TCP/IP package manual.
- 

### **ERROR CODE E4015** TELNET) IAC receive error. CODE=XX.

During TCP/IP communication, an error occurred when receiving data.

- ⇒ Check the communication line to the target end node and repair as necessary.
  - ⇒ Check for problems at the target end node and repair as necessary.
  - ⇒ Ensure the PC at the target end is using KCWIN TCP software.
  - ⇒ The sub-error code (CODE=XX) is generated by the TCP/IP package. Refer to the TCP/IP package manual.
- 

### **ERROR CODE E4016** TELNET) Close failure. CODE =XX.

An error occurred in the LISTEN/ACCEPT function during an attempt to close the socket. TCP/IP resources (queue or buffer) may be full. May be a problem with the communication line or at the target end node.

- ⇒ Stop any other TCP/IP functions operating at the same time.
  - ⇒ Cycle robot controller power OFF and ON.
  - ⇒ The sub-error code (CODE=XX) is generated by the TCP/IP package. Refer to the TCP/IP package manual.
- 

### **ERROR CODE E4017** TELNET) Main socket close failure. CODE=XX.

An error occurred in the LISTEN/ACCEPT function during an attempt to close the main socket. TCP/IP resources (queue or buffer) may be full. May be a problem with the communication line or at the target end node.

- ⇒ Stop any other TCP/IP functions operating at the same time.
  - ⇒ Cycle robot controller power OFF and ON.
  - ⇒ The sub-error code (CODE=XX) is generated by the TCP/IP package. Refer to the TCP/IP package manual.
-

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## TROUBLESHOOTING

**ERROR CODE E4018** TELNET) System error. CODE=XX.

Parameter settings entered using the NETCONF command does not comply with AS Language syntax.

The code (CODE=xx) indicates a detailed SUB error code for the TCP/IP package.

⇒ *Refer to the TCP/IP package manual.*

⇒ *Ensure the parameter settings are entered in compliance with AS Language syntax.*

---

**ERROR CODE E4019** TCP/IP) Socket open failure. CODE=XX  
Dst.IP=xx.xx.xx.xx.

This error occurs when execution of a socket open instruction (TCP\_LISTEN/TCP\_CONNECT/UDP\_SENDTO/UDP\_RECVFROM) fails. If multiple socket numbers are used, the number of sockets may exceed the limit. Possible IP address parameter error.

⇒ *Ensure during multiple socket openings do not exceed limits.*

⇒ *Ensure the IP address parameters are correct.*

⇒ *The sub-error code (CODE=XX) is generated by the TCP/IP package. Refer to the TCP/IP package manual.*

---

**ERROR CODE E4020** TCP/IP) Socket close failure. CODE=XX  
Dst.IP=xx.xx.xx.xx.

This error occurs when socket closing instruction (TCP\_CLOSE/TCP\_END\_LISTEN/UDP\_SENDTO/UDP\_RECVFROM) fails. May be a problem with the communication line or at the target end node.

⇒ *Check the communication line to the target end node and repair as necessary.*

⇒ *Check for problems at the target end node and repair as necessary.*

⇒ *The sub-error code (CODE=XX) is generated by the TCP/IP package. Refer to the TCP/IP package manual.*

---

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## TROUBLESHOOTING

**ERROR CODE E4021** TCP/IP) Communication Error. CODE=XX  
Dst.IP=xx.xx.xx.xx.

A communication error occurred during execution of the UDP\_SENDTO/  
UDP\_RECVFROM/TCP\_SEND/TCP\_RECV instruction. May be a problem with the  
Ethernet line or at the target end.

- ⇒ Check the communication line to the target end node and repair as necessary.
  - ⇒ Check for problems at the target end node and repair as necessary.
  - ⇒ The sub-error code (CODE=XX) is generated by the TCP/IP package. Refer to the TCP/IP package manual.
- 

**ERROR CODE E4022** TCP/IP) Message is too long.

Data sent exceeds the allowed size limit using the TCP\_SEND/UDP\_SENDTO/  
UDP\_RECVFROM instruction.

- ⇒ Edit the data to within allowed size limit (TCP: 4096 bytes or less, UDP: 1472 bytes or less).
- 

**ERROR CODE E4023** TCP/IP) Cannot reach the Host.

Failed to connect with the target end node when executing the UDP\_SENDTO/  
UDP\_RECVFROM/TCP\_CONNECT instruction. The host of the corresponding IP  
address does not exist on the network. Designated port number or IP address may be  
wrong. May be a problem with the communication line or at the target end node.

- ⇒ Ensure the port number and the IP address are correct.
  - ⇒ Ensure the parameter settings comply with AS Language syntax.
  - ⇒ Check the communication line to the target end node and repair as necessary.
- 

**ERROR CODE E4024** TCP/IP) Communication Time Out.  
Dst.IP=xx.xx.xx.xx.

Communication time-out occurred during instruction execution. May be a problem with  
the Ethernet line or at the target end node.

- ⇒ Check the communication line to the target end node and repair as necessary.
-

---

## TROUBLESHOOTING

**ERROR CODE E4025** TCP/IP) Connection aborted.

Communication is disconnected during execution of the UDP\_SENDTO/UDP\_RECVFROM/TCP\_CONNECT/TCP\_SEND/TCP\_RECV/TCP\_ACCEPT instruction. May be a problem with the Ethernet line or at the target end node.

⇒ *Check the communication line to the target end node and repair as necessary.*

---

**ERROR CODE E4026** TCP/IP) No Buffer Space.

A communication error occurred during execution of the UDP\_SENDTO/UDP\_RECVFROM/TCP\_SEND/TCP\_RECV instruction. TCP/IP resources (queue or buffer) may be full.

⇒ *Stop any other TCP/IP functions operating at the same time.*

⇒ *Cycle robot controller power OFF and ON.*

⇒ *Check the communication line to the target end node and repair as necessary.*

---

**ERROR CODE E4027** TCP/IP) Bad Socket.

Failed to connect with the target end node when executing the UDP\_SENDTO/UDP\_RECVFROM/TCP\_CONNECT instruction. Designated port number or IP address may be wrong. May be a problem with the Ethernet line or at the target end node.

⇒ *Ensure the port number and the IP address are correct.*

⇒ *Ensure the parameter settings comply with AS Language syntax.*

⇒ *Check the communication line to the target end node and repair as necessary.*

---

**ERROR CODE E4028** FTP) Data receive error. (code=XX)

Failure to receive the teach data via LAN→Memory (Manual LOAD), or the LAN file directory information list. May be a communication cable connection problem.

⇒ *Ensure the communication cable connections are correct and re-execute.*

---

---

## TROUBLESHOOTING

**ERROR CODE E4029** FTP) Data send error. (code=XX).

Failure to transmit the teach data via Memory→LAN (Manual SAVE). May be a communication cable connection problem.

⇒ *Ensure the communication cable connections are correct and re-execute.*

---

**ERROR CODE E4031** FTP) Failed to disconnect with FTP server. (code=XX)

Failure to terminate when completing communication with the FTP server.

Probable causes:

1. Communication cable is not properly connected.
2. The remote host FTP server is OFF or is in an abnormal condition.

⇒ *Ensure the communication cable is properly connected and re-execute.*

⇒ *Reboot the remote host FTP server.*

---

**ERROR CODE E4032** FTP) Unregistered OS detected.

An unregistered OS is detected.

⇒ *Register the detected OS.*

---

**ERROR CODE E4033** FTP) Failed to connect with server. (code=XX)

The connection failed when communication is started with the FTP server.

Main causes include:

1. The designated address does not exist on the network.
2. Communication cable is not properly connected.
3. Failed to login to FTP server.

⇒ *Ensure the IP address is correct in Set Remote Host Information.*

⇒ *Ensure the communication cable is properly connected, and re-execute.*

⇒ *Ensure the user name and password for the LAN remote host save/load settings are correct.*

---

---

## TROUBLESHOOTING

**ERROR CODE E4034** FTP) failed to receive HOST OS information. (code=XX)

Error occurred during receiving OS information from the server.

⇒ *Ensure the communication cable is properly connected, and re-execute.*

⇒ *Reboot the FTP server.*

---

**ERROR CODE E4036** FTP) FTP service busy now.

A command is being executed by the server.

⇒ *Allow the current command to complete execution, and re-execute.*

⇒ *If this error recurs contact KRI customer service.*

---

**ERROR CODE E4037** FTP) Failed AUTO-SAVing.

An error occurred during auto save; an additional error code is displayed after the error message.

⇒ *Follow the procedures for the error displayed after the error message.*

---

**ERROR CODE E4050** No response from the FDD/PC\_CARD driver board.

A SAVE/LOAD etc. command is requested by the 1KA board, but no response is received from the 1KF board.

⇒ *Check harness and connections to the 1KF board and repair as necessary.*

⇒ *Replace the 1KA/1KF boards.*

---

**ERROR CODE E4051** No communication with FDD/PC\_CARD driver board.

No communication between the 1KA and 1KF boards.

⇒ *Check harness and connections to the 1KF board and repair as necessary.*

⇒ *Replace the 1KA/1KF boards.*

---

---

## TROUBLESHOOTING

**ERROR CODE E4052** [FDD/PC\_CARD] Failed to set verify function. Please set again.

Failure to set condition for verify function for the 1KF board.

⇒ *Re-set condition for verify function in AUX 0208.*

---

**ERROR CODE E4053** Channel error.

A monitor or program instruction is executed on an unavailable channel.  
Example: Port number is not set within 8192–65535 for UPD\_SENDTO.

⇒ *Specify an available channel.*

---

**ERROR CODE E4054** TCP/IP) Cannot execute because Ethernet board not installed.

Main causes include:

1. 1KN board (daughter board on the 1KA board) is not installed.
2. Defective 1KN/1KA boards.

⇒ *Ensure the 1KN board is properly installed.*

⇒ *Replace the 1KA/1KN boards.*

---

**ERROR CODE E4055** TCP) Cannot create a socket.

Failure to open a socket when TCP\_LISTEN/TCP\_CONNECT is executed.

Main causes include:

1. Too many sockets open.
2. Same port is used too many times.

⇒ *Close opened sockets using TCP\_CLOSE and re-execute TCP\_LISTEN/TCP\_CONNECT.*

⇒ *Avoid executing too many instructions at a time.*

⇒ *Ensure parameters are correct.*

---

---

## TROUBLESHOOTING

**ERROR CODE E4056** TCP) This port is not in LISTEN (SOCK).

Main causes include:

1. Failure to open the socket when executing TCP\_ACCEPT.
2. Failure to close the socket when executing TCP\_END\_LISTEN.

⇒ *Ensure correct port number is used.*

⇒ *Ensure the parameter settings are entered in compliance with AS Language syntax.*

---

**ERROR CODE E4057** TCP) Illegal Socket ID.

Communication error occurred when executing TCP\_SEND/TCP\_RECV, or failure to close socket when executing TCP\_CLOSE/TCP\_END\_LISTEN.

Main causes include:

1. The socket ID number or port number is not created.
2. Incorrect program execution order.

⇒ *Ensure the correct socket ID number or port number is used.*

⇒ *Ensure the program execution order is correct*

---

**ERROR CODE E4058** Failed download to FDD/PC\_CARD driver board.

Failed to download software to the floppy disk driver board or the PC card driver board (1KF board).

⇒ *Ensure proper 1KF board software download settings are used.*

⇒ *If the error recurs, replace the 1KF board.*

---

**ERROR CODE E4500** ANYBUS) IN-AREA request timeout. XX

Main causes include:

1. Error lamp ON:  
Request for access to the output signal writing area is rejected due to hardware abnormality.
2. Error lamp OFF:  
Access to the output signal writing area is not released due to hardware abnormality.

⇒ *Check LED indicator on the interface card, and reset the error.*

⇒ *If the error message is still displayed, contact KRI customer service, include the sub-code XX.*

---



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## TROUBLESHOOTING

**ERROR CODE E4501** ANYBUS) OUT/FB.CTRL release timeout. XX

Access to the input signal reading area is not released due to defective hardware.

⇒ *Check LED indicator on the interface card, and reset the error.*

⇒ *If the error message is still displayed contact KRI customer service, include the sub-code XX.*

---

**ERROR CODE E4510** DN) Master status. XX

The status of the master port changed due to faulty communication, caused by cable disconnection during DeviceNet communication. XX indicates the status code.

⇒ *Check the status sub-code XX and reset the error.*

---

**ERROR CODE E4511** DN) Node status. XX

The status of the slave node changed due to faulty I/O communication, caused by DeviceNet slave node cable disconnection.

⇒ *Use the status sub-code XX as a troubleshooting aid.*

⇒ *Check the DeviceNet slave node cable and connections, and repair as necessary.*

---

**ERROR CODE E4512** ABM-DN) Mailbox error.

An error is returned because data sent the mailbox is not accepted due to incorrect DeviceNet parameter setting.

⇒ *Ensure the MAC\_ID specified for the slave node and the parameter settings are correct, and re-execute DEVNET command.*

---

**ERROR CODE E4520** ABMA-PDP) Status STOP. XX

During I/O communication in auto clear mode, an error occurred in the slave node and the status of AnyBus PROFIBUS-DP master changed to STOP.

⇒ *Check the connections of the fieldbus cable and repair as necessary.*

⇒ *Use the sub-code XX as a troubleshooting aid, clear the cause of the error and reset the error.*

---

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## TROUBLESHOOTING

### **ERROR CODE E4521** ABMA-PDP) Status OFFLINE. XX

An error occurred in the ABMA-PDP module, and the status of AnyBus PROFIBUS-DP master changed to OFFLINE.

⇒ *Use the sub-sub-code XX as a troubleshooting aid, clear the cause of the error and reset the error.*

⇒ *If the error recurs, cycle the controller power OFF and ON.*

---

### **ERROR CODE E4522** ABMA-PDP) I/O data communication error. XX

During I/O communication, configuration data is downloaded to the interface card, then communication is disconnected.

⇒ *Use the sub-code XX as a troubleshooting aid, clear the cause of the error and reset the error.*

---

### **ERROR CODE E4523** ABMA-PDP) sending of timed out I/O data. XX

The ABMA-PDP module is overloaded and output signals from the AS system cannot be processed within the allowed time.

⇒ *Check the fieldbus cable connections and repair as necessary.*

⇒ *Use the sub-code XX as a troubleshooting aid, clear the cause of the error and reset the error.*

---

### **ERROR CODE E4524** ABMA-PDP) Timeout of receiving I/O data. XX

ABMA-PDP module overload, input signals from the slave cannot be processed within the allowed time.

⇒ *Check the fieldbus cable and connections, repair/replace as necessary.*

⇒ *Use the sub-code XX as a troubleshooting aid, clear the cause of the error and reset the error.*

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## TROUBLESHOOTING

**ERROR CODE E4525** ABMA-PDP) Timeout of sending message. XX

ABMA-PDP module overload, sending message cannot be processed within the allowed time.

- ⇒ *Check the fieldbus cable and connections, repair/replace as necessary.*
  - ⇒ *Use the sub-code XX as a troubleshooting aid, clear the cause of the error and reset the error.*
- 

**ERROR CODE E4526** ABMA-PDP) Timeout of receiving message. XX

ABMA-PDP module overload, receiving message cannot be processed within the allowed time.

- ⇒ *Check the fieldbus cable and connections, repair/replace as necessary.*
  - ⇒ *Use the sub-code XX as a troubleshooting aid, clear the cause of the error and reset the error.*
- 

**ERROR CODE E4527** ABMA-PDP) Check configuration data. XX

Incorrect configuration data or bus parameter is downloaded. Download cannot be completed after error reset.

- ⇒ *Use the sub-code XX as a troubleshooting aid, ensure correct configuration data and bus parameters are used and re-execute download.*
  - ⇒ *If the number of external I/O signals is changed, cycle controller power OFF and ON.*
- 

**ERROR CODE E4528** PROFIBUS) Slave Diag-error response detected. XX

Incorrect slave diagnosis command parameter is entered. If sub-code XX=A1 (hexadecimal notation), the node address used is out of range.

- ⇒ *Ensure the correct parameters and node address are used.*
  - ⇒ *Check the fieldbus cable and connections, repair/replace as necessary.*
-

---

## TROUBLESHOOTING

**ERROR CODE E4529** PROFIBUS) Statistic counter-error response detected. XX

Incorrect slave diagnosis command parameter is entered.

⇒ *Use the sub-code XX as a troubleshooting aid, clear the cause of the error and reset the error.*

⇒ *Ensure the correct parameters and node address are used.*

---

**ERROR CODE E4530** DN) DeviceNet cable is disconnected.

DeviceNet cable connected to the slave device is disconnected while system switch DN\_DISCON\_ERR is ON.

⇒ *Reset the error in teach mode, and move the robot to a pose to enable access for troubleshooting.*

⇒ *Check the DeviceNet cable and connections, repair/replace as necessary.*

---

**ERROR CODE E5000** Connected permission signal has not been turned ON.

Dedicated gun connection “OK” signal is OFF when gun connection is executed.

⇒ *Ensure gun connection “OK” signal is ON, re-execute gun connection.*

---

**ERROR CODE E5001** RWC type is not process control type.

This error occurs when welder type setting is set to adaptive control and the weld controller connected to the system is not an adaptive control type.

⇒ *Ensure welder type setting is correctly set to adaptive control or constant current control.*

---

**ERROR CODE E5002** 1GS board is not process control type.

This error occurs when welder type setting is set to adaptive control and the 1GS board and 1GS board software are not compatible with adaptive control.

⇒ *Replace the 1GS board and 1GS board software with adaptive control components.*

---

---

## TROUBLESHOOTING

**ERROR CODE E5003** Illegal extend (retract) output signal.

Occurs when the output signals for the extend and retract operation of a spot welding application are not properly set.

⇒ *Check the setting in AUX 0605.*

---

**ERROR CODE E5004** Weld completion signal already input.

Displayed when the weld completion signal is received before the weld initiate output.

Main causes include:

1. Weld completion signal is not set OFF, after the last welding step.
2. Before the weld completion signal is set OFF, the robot started execution of the next welding step.

⇒ *Check operation of welding equipment (gun and weld controller/timer), check the signal number setting in AUX 0605-11, repair/modify as necessary.*

⇒ *Check the 1KA/1GW (1HW) boards and replace as necessary.*

⇒ *Check the interlock circuit and repair as necessary.*

⇒ *Check program data, weld timing, and welding data settings, modify as necessary*

---

**ERROR CODE E5005** Welding schedule setting data is abnormal.  
(Spot weld specifications type B)

The weld conditions set for the program welding point are out of range or not set for clamp 1.

⇒ *Ensure the correct weld conditions are set for the program weld point.*

---

**ERROR CODE E5006** CLAMP SPEC is not set PULSE.

The error occurs when the spot weld clamp signal specification in the system (robot system switch RWC=ON) is set to level instead of pulse.

⇒ *Ensure the spot weld clamping signal specification is set to pulse using the SETCLAMP AS Language command.*

---

---

**TROUBLESHOOTING**

**ERROR CODE E5007** Servo weld gun not connected or wrong gun connected.  
(Servo spot weld gun only)

Main causes include:

1. The robot executes a step when a gun is not attached to the tool changer.
2. The gun number in the tool changer is different than the gun number specified for the program step.
3. Incorrect gun number is read due to damaged gun harness.

⇒ *Execute the step in manual mode or manually install the correct gun. In the teach or check mode, verify connection of the gun by pressing the connect/separate button.*

⇒ *If the correct gun is attached to the tool changer, confirm that the gun signal number (AUX 0605-41, GUN CONNECTION SIGNAL) is correct. From the MONITOR (INPUT SIGNAL) screen, confirm that the signal number is received.*

⇒ *Inspect the connections between the gun and the 1FG board and repair as necessary.*

⇒ *Check gun harness and connections and repair/replace as necessary.*

⇒ *Temporarily set the gun connect signal number (AUX 0605-41, GUN CONNECTION SIGNAL) to 0 (when the gun connect number is set to 0, the error is not detected); ensure that the correct gun is in the tool changer. Repair the gun connection and set the gun connect signal number as soon as possible.*

---

**ERROR CODE E5008** Tip wear measurement (stage 1) was not executed.  
(Servo spot weld gun only)

The tip wear measurement program stage 2 (reference plate) is attempted, without first performing stage 1.

⇒ *Execute tip wear measurement program stage 1 prior to executing stage 2.*

---

**ERROR CODE E5009** Work sensing signal (gun\_tip touch signal) is not set.  
(Servo spot weld gun only)

A workpiece thickness measurement is attempted, when the gun tip touch signal (set in AUX 1021) has not been received.

⇒ *Set the gun tip touch signal number (AUX 1021).*

---

---

## TROUBLESHOOTING

**ERROR CODE E5010** Servo weld gun mechanical parameter is not set.  
(Servo spot weld gun only)

A new gun is connected and the mechanical parameters are not defined in AUX 1021.

⇒ *Define the parameters in AUX 1021.*

---

**ERROR CODE E5011** This clamp number already set for servo weld gun axis.  
(Servo spot weld gun only)

This error occurs when a servo spot weld gun number is duplicated using the ZAXIS AS Language command or AUX 2002.

⇒ *Ensure the servo spot weld gun numbers are not duplicated using the ZAXIS AS Language command or AUX 2002.*

---

**ERROR CODE E5012** Cannot change the gun because offset data is abnormal.

The encoder offset data set for the gun is different at time of gun change.

⇒ *Ensure encoder offset data for all guns is the same.*

---

**ERROR CODE E5013** Cannot change multiple guns at the same step.  
(Servo spot weld gun only)

The operator is attempting to execute a step with more than one gun change.

⇒ *Edit the program so that there is only one gun change per step.*

---

**ERROR CODE E5014** Gun is connected other.

The tool changer is attempting to connect to a gun that is already connected to another axis tool changer or is missing.

⇒ *Select a different gun or disconnect the gun from the other tool changer.*

---

---

## TROUBLESHOOTING

**ERROR CODE E5015** Gun status data disagrees with clamp condition.  
(Servo spot weld gun only)

Incorrect program data is used.

Main causes include:

1. Clamp ON is taught in a step that includes a gun change.
2. Clamp OFF is taught in a step that includes a point for “wear measurement using automatic clamping”, “wear measurement reference plate”, or “work position deviation measurement”.

⇒ *Ensure clamp OFF is taught in a step that includes a gun change.*

⇒ *Ensure clamp ON is taught in a step that includes a point for “wear measurement using automatic clamping”, “wear measurement reference plate”, or “work position deviation measurement”.*

---

**ERROR CODE E5016** Data of SRVPRESS is wrong.

This error occurs when the welding clamp pressure change cycle ratio number for the servo gun is other than SRV3PRESS, SRV4PRESS, SRV5PRESS, or SRV6PRESS.

⇒ *Ensure the cycle ratio number is set correctly.*

---

**ERROR CODE E5017** Wear base data is not registered.

This error occurs when the tip wear base data entry was not made and the tip wear measurement operation is performed.

⇒ *Ensure tip wear base data entry is performed before tip wear measurement operation is performed.*

---



## TROUBLESHOOTING

**ERROR CODE E5018** Weld completion signal has not been detected.

Occurs when a weld complete signal is not received in the allowed time period.

Main causes include:

1. Defective weld gun, weld controller/timer, cable, etc.
2. Defective 1KA/1GW (1HW) boards, or harness, etc.
3. Defective interlock circuit.
4. Noise related malfunction.

⇒ *Check gun, weld controller/timer, cable, etc. and repair/replace as necessary.*

⇒ *Check 1KA/1GW (1HW) boards and harness and replace as necessary.*

⇒ *Check for noise malfunction and shield integrity.*

---

**ERROR CODE E5019** Weld fault signal is detected.

Main causes include:

1. Defective weld gun, weld controller/timer, cable, etc.
2. Defective 1KA/1GW (1HW) boards, harness, etc.
3. Defective interlock circuit.
4. Noise related malfunction.

⇒ *Check gun, weld controller/timer, cable, etc. and repair/replace as necessary.*

⇒ *Check 1KA/1GW (1HW) boards and harness and replace as necessary.*

⇒ *Check for noise malfunction and shield integrity.*

---

**ERROR CODE E5020** Retract pos. monitor error.

Occurs when the input signal for the retract operation of a 2-stroke retractable gun is not received.

Main causes include:

1. Defective weld gun, weld controller/timer, cable, etc.
2. Defective 1KA/1GW (1HW) boards, harness, etc.
3. Defective interlock circuit.
4. Incorrect retract position input signal setting.
5. Noise related malfunction.

⇒ *Check gun, weld controller/timer, cable, etc. and repair/replace as necessary.*

⇒ *Check 1KA/1GW (1HW) boards and harness and replace as necessary.*

⇒ *Ensure the retract position input signal setting is correct.*

⇒ *Check for noise malfunction and shield integrity.*

---

---

## TROUBLESHOOTING

### **ERROR CODE E5021**      Extend pos. monitor error.

Occurs when the input signal for the extend operation of a 2-stroke retractable gun is not received.

Main causes include:

1. Defective weld gun, weld controller/timer, cable, etc.
2. Defective 1KA/1GW (1HW) boards, harness, etc.
3. Defective interlock circuit.
4. Incorrect extend position input signal setting.
5. Noise related malfunction.

⇒ *Check gun, weld controller/timer, cable, etc. and repair/replace as necessary.*

⇒ *Check 1KA/1GW (1HW) boards and harness and replace as necessary.*

⇒ *Ensure the extend position input signal setting is correct.*

⇒ *Check for noise malfunction and shield integrity.*

---

### **ERROR CODE E5022**      Current gun retract position differs from a destination.

In the check mode, retractable gun output signals are monitored and compared to clamp condition code and open/close data for a specific step. If the data does not match, this error is displayed.

⇒ *Ensure settings in clamp condition code and open/close data match output signal settings, check operation of gun with the clamp key.*

---

### **ERROR CODE E5023**      Wear is abnormal, cannot take measurement.

When executing tip wear measurement, the moving or fixed tip wear exceeds the allowed value.

⇒ *Replace the worn gun tip.*

⇒ *Ensure tip wear measurement data is correct.*

---

---

## TROUBLESHOOTING

**ERROR CODE E5024** Pressurization comp. signal has not been detected.

Pressurization completion signal is not received from the weld controller/timer.

Main causes include:

1. Defective weld controller/timer.
2. Defective servo spot weld gun.
3. Defective harness, cable, etc.

⇒ *Check weld controller/timer, servo spot weld gun, harnesses, and cables and repair/replace as necessary.*

---

**ERROR CODE E5025** Gun opening comp. signal has not been detected.

Gun opening completion signal is not received from the servo weld gun.

Main causes include:

1. Defective servo spot weld gun.
2. Defective servo spot weld gun cable, cable connections, tool changer, etc.

⇒ *Check the servo spot weld gun, servo spot weld gun cable, cable connections, and tool changer contacts and connections and repair/replace as necessary.*

---

**ERROR CODE E5026** RWC error -xx.  
(Spot weld specifications type B)  
(-xx: represents the welder number)

The current flow from the specified remote weld controller (RWC) is abnormal.

Main causes:

- |   |                     |
|---|---------------------|
| 20: SCR overheat                                | 21: Memory abnormal |
| 22: Power failure                               | 23: System error    |
| 24: Defective electro-valve (gun control valve) |                     |

Main causes include:

Insufficient SCR cooling, a memory data error, weld current is not synchronized with gun clamp conditions, system error, or gun control valves malfunction.

⇒ *Check welder and weld gun repair/replace as necessary.*

⇒ *Check 1GS board, and communication cables repair/replace as necessary.*

---

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## TROUBLESHOOTING

**ERROR CODE E5027**      Robot stopped during weld.  
(Spot weld specifications type C)  
(Servo spot weld gun only)

This error occurs when the robot is placed in a HOLD or an E-STOP condition after the clamp output signal is sent, and before the weld complete signal is received.

⇒ *Return the system to normal operation and re-execute weld.*

---

**ERROR CODE E5028**      Cannot achieve set force.

The gun does not obtain the set closing pressure within 5 seconds after the gun starts closing.

Main causes include:

1. Tip wear measurement is not executed.
2. Incorrect taught point (closing pressure is not defined for the recorded position).
3. Closing pressure is set too high.
4. Workpiece is too thin.
5. Incorrect lower limit motion setting (LLIMIT command).

⇒ *Perform the tip wear measurement.*

⇒ *Reteach the point.*

⇒ *Decrease the closing pressure.*

⇒ *Ensure the workpiece specifications are correct and the workpiece is in the correct position.*

⇒ *Ensure lower limit motion is set correctly (LLIMIT command).*

---

**ERROR CODE E5029**      Gun tip stuck.

Indicates that the tips are stuck. More power is required to open the gun, following a weld, than the stuck detection value, set in AUX 1021 Force for Stuck Detection [kgf].

If the stuck detection value is set below the power level required for normal operation, the gun cannot operate properly and the error is set.

⇒ *If the gun is stuck, release it manually.*

⇒ *If the gun is not stuck, verify that the stuck detection value (AUX 1021, Force for Stuck Detection [kgf]) is set correctly. This setting may need to be increased.*

---

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## TROUBLESHOOTING

**ERROR CODE E5030**      Copper plate wear exceeds limit. step=XX.  
(Servo spot weld gun only)

The copper backing plate wear exceeds the copper plate wear limit (AUX 1029). The error is detected when the gun executes a weld.

⇒ *Replace the copper backing plate.*

---

**ERROR CODE E5031**      Weld completion signal is not turned off.

This error occurs when the weld completion and weld initiate signals are high (ON) at the same time for three seconds.

⇒ *Change the weld complete signal to a pulsed signal with a duration of less than three seconds.*

⇒ *Set the weld complete signal OFF using the rising-edge-trigger in the welding instruction.*

---

**ERROR CODE E5032**      Calibration did not end normally.  
(Servo spot weld gun only)

During calibration operation after a gun change calibration is aborted.

Main causes include:

1. E-stop condition.
2. Changing modes during calibration.

⇒ *Reset the error and perform a manual gun change.*

---

---

## TROUBLESHOOTING

**ERROR CODE E5033** Cannot weld because of abnormal thickness.  
(Servo spot weld gun only)

The thickness of the workpiece is out of tolerance.

Main causes include:

1. Defective workpiece.
2. Incorrect positioning of the workpiece.
3. A gap between the two panels being welded.
4. Current tip wear (AUX 1029) and actual tip wear are different.

⇒ *Inspect the workpiece. Measure the thickness and positioning; replace workpiece and/or correct abnormal positioning.*

⇒ *Execute the tip wear measurement program. Manually measure the tip wear; compare these measurements to the current tip wear data (AUX 1029).*

---

**ERROR CODE E5034** Tip wear exceeds limit. (MOVING SIDE)

Moving tip wear exceeds the set maximum wear limit during wear measurement.

⇒ *Replace the moving tip.*

---

**ERROR CODE E5035** Tip wear exceeds limit. (FIXED SIDE)

Fixed tip wear exceeds the set maximum wear limit during wear measurement.

⇒ *Replace the fixed tip.*

---

**ERROR CODE E6001** Step after XD(2)START must be LMOVE or HMOVE.

Incorrect motion instruction is taught. The step following XD(2)START requires an LMOVE or HMOVE motion instruction for touch sensing.

⇒ *Ensure the step following XD(2)START is an LMOVE or HMOVE.*

---

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## TROUBLESHOOTING

**ERROR CODE E6002** Signal condition already input.

The signal condition is already met when an XDMOVE or XD(2)START move is executed and the signal monitoring starts.

⇒ *Check input signal timing for the door open detection signal and the monitored signals, and correct interlock data or program data as necessary.*

---

**ERROR CODE E6003** Door open detect signal is not dedicated.

During XD(2)START execution, the input signal for door open state is not set as a dedicated input signal.

⇒ *Set the input signal from the sensor for detecting door open/close state as a dedicated input signal.*

---

**ERROR CODE E6004** Location data was not detected.

An attempt to acquire compensation value from the door open state sensor is made, but the pose data that incorporates the compensation value could not be acquired because the door detecting instruction was not executed.

⇒ *Check the program data and add XDMOVE or XD(2)START before executing XDGET instruction.*

---

**ERROR CODE E6006** Signal not detected.

Main causes include:

1. As the robot moves the specified distance per XDMOVE or XD(2)START with sensing enabled, the monitored signal condition is not met.
2. Signal condition is not met within the time specified by DIN\_WAIT instruction.

⇒ *Check the timing of the door open detection input signal and the signals monitored by XDMOVE or XD(2)START, and correct the interlock data or program data as necessary.*

---

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## TROUBLESHOOTING

**ERROR CODE E6007** Wrist can't be straightened any more (Singular point 1).

The posture of JT5 is set too close to 0 degrees (or a multiple of 360 degrees) on a robot equipped with a 3S type wrist.

**NOTE**

This does not normally occur in joint mode, but may occur with conveyor synchronous function enabled.

- ⇒ *Change wrist posture.*
  - ⇒ *Move the robot in joint interpolation.*
  - ⇒ *Change the wrist posture before enabling conveyor synchronous function, to prevent this error.*
- 

**ERROR CODE E6008** Wrist can't be bent any more. (Singular point 2).

The posture of JT5 is set too close to 180 degrees (or multiple of  $\pm 360$  degrees) on a robot equipped with a 3S wrist.

**NOTE**

This does not normally occur in joint mode, but may occur with conveyor synchronous function enabled.

- ⇒ *Change wrist posture.*
  - ⇒ *Move the robot in joint interpolation.*
  - ⇒ *Change the wrist posture before enabling conveyor synchronous function, to prevent this error.*
-



---

## TROUBLESHOOTING

**ERROR CODE E6012** Relative distance between guns is too near.

The gun tips of two networked robots is less than the minimum specified distance for the application.

⇒ *If this error occurs in teach mode, drive the axes so the distance between gun tips is within specified value.*

⇒ *If this error occurs in check/repeat mode, modify the program data, and change the motion timing and relative distance.*

### NOTE

If this error does not occur in a near-miss condition, check the distance (and home position) set for error detection for the robot pair.

---

**ERROR CODE E6500** No welding interface board.

The welding interface (1GN) board is not detected at control power ON.

⇒ *Turn control power off and confirm that the welding interface (1GN) board is mounted to the 1GW (1HW) board.*

⇒ *Confirm that the welding interface (1GN) board is not loose. Insert the board firmly.*

⇒ *Replace the 1GW/1GN (1HW/1GN) board.*

---

**ERROR CODE E6501** No. 2 welding interface board not found.

The polarity ratio function is set for analog output, or an additional 1GW (1HW) board is required for 3, or more, analog output channels.

⇒ *Install additional 1GW (1HW) board as required.*

⇒ *Ensure 1GW (1HW) boards are properly installed.*

---

---

## TROUBLESHOOTING

### **ERROR CODE E6502**      Arc failure.

The signal (current detection: WCR) that indicates the robot is executing the weld was not returned from the weld controller/timer within 1 second, or less, after welding started.

Main causes include:

1. Arc is not generated when welding starts.
2. Arc generation is interrupted for 1, or more, seconds during welding.

⇒ *Check for insulating debris that prevents welding, clear debris as necessary.*  
⇒ *Confirm that adequate supply of wire is available.*  
⇒ *Confirm that wire is not stuck to the welding tip.*  
⇒ *Check weld controller/timer and cables, repair/replace as necessary.*

---

### **ERROR CODE E6503**      Wire stuck.

Main causes include:

1. Welding and crater fill are completed and the arc is set OFF, but a weld stuck detection signal is received. The weld stuck detection signal does not clear after the escape process is executed.
2. The wire is stuck to the base metal at weld completion.

⇒ *Cut the wire and re-execute weld.*  
⇒ *Change weld conditions if problem occurs frequently.*

---

### **ERROR CODE E6504**      Arc start failed.

The signal (current detection: WCR), that indicates the robot is executing the weld, is not return from the weld controller/timer at welding start.

Main causes include:

1. Insulating debris that prevents welding.
2. Welding wire feed supply ran out, or wire is stuck to welding tip.

⇒ *Check for insulating debris that prevents welding, clear debris as necessary.*  
⇒ *Confirm that adequate supply of wire is available.*  
⇒ *Confirm that wire is not stuck to the welding tip.*

---

---

## TROUBLESHOOTING

**ERROR CODE E6505**      Arc weld insulation defect.

This error occurs when robot movement causes insulation failure.

⇒ *Ensure the welder, torch, and robot insulation are in good working condition.*

---

**ERROR CODE E6506**      Torch interference.

The limit switch for torch interference detection is tripped or damaged.

After the error is reset the robot can be moved in teach mode. The robot cannot be moved in repeat mode until the limit switch is reset.

⇒ *Move the robot away from the interference to close the limit switch. Inspect the torch for damage.*

⇒ *Determine the cause of the interference before continuing operation.*

⇒ *Replace damaged limit switch and/or harness, as necessary.*

---

**ERROR CODE E6507**      Illegal interpolation data.

A welding step is taught as joint interpolation with arc welding specification software.

⇒ *Welding steps must use linear or circular interpolation for arc welding specification software. Ensure the interpolation is correct.*

---

**ERROR CODE E6509**      No work detected.  
(Touch sensing)

Occurs when touch sensing does not detect the workpiece within the range of the touch sensing distance set in system data, or no workpiece is present.

⇒ *Reset the workpiece in the proper position.*

⇒ *Increase the range of touch sensing distance in system data (increases touch sensing time).*

---

---

## TROUBLESHOOTING

**ERROR CODE E6510** Undefined sensing direction.  
(Touch sensing)

Occurs when the step proceeding the WORK\_DETECT instruction is not an air\_cut point.

- ⇒ *Insert an air\_cut point in the program before the WORK\_DETECT instruction.*
- ⇒ *When using step select to chose the start step, select the air\_cut point before the WORK\_DETECT instruction in the program.*

---

**ERROR CODE E6511** Insufficient num. of sensing points.  
(Touch sensing)

The number of steps taught with the work deviation compensation function is insufficient for the number of sensing points, or an air\_cut point is not taught immediately following the sensing point.

Example:

1. AC JOINT SPEED9 ACCU4 TIMER0 MOTHER\_RESET
2. AC LINEAR SPEED9 ACCU4 TIMER0 **MOTHER\_WORK2** (error occurs at this step)
3. WS LINEAR SPEED9 TIMER0

Step set two pattern 2 (with 2 sensing points) and step 3 is a weld start point instead of an air\_cut point.

- ⇒ *Add the required air\_cut sensing points (two points in this example).*

Example:

2. AC LINEAR SPEED9 ACCU4 TIMER0 MOTHER\_WORK2
  - 3. AC JOINT SPEED9 ACCU4 TIMER0**
  - 4. AC LINEAR SPEED9 ACCU4 TIMER0 MOTHER\_WORK2**
  5. WS LINEAR SPEED9 TIMER0
-

---

## TROUBLESHOOTING

**ERROR CODE E6512** Undefined mother or daughter work.  
(Touch sensing)

Main causes include:

1. A previous work instruction is not completed before another work instruction is executed.
2. Program execution is started at a step in that does not allow completion of a previous work instruction.

Example:

1. AC JOINT SPEED9 ACCU4 TIMER0 MOTHER\_RESET
2. AC LINEAR SPEED9 ACCU4 TIMER0 **DAUGHTER\_WORK2** (error occurs at this step)

⇒ *Add the required steps in the program to complete the first work instruction before another work instruction is executed (in this example a step is inserted before step 2).*

Example:

1. AC JOINT SPEED9 ACCU4 TIMER0 MOTHER\_RESET
2. AC LINEAR SPEED9 ACCU4 TIMER0 **MOTHER\_WORK1**
3. AC LINEAR SPEED9 ACCU4 TIMER0 DAUGHTER\_WORK2

---

**ERROR CODE E6513** Too many sensing points.  
(Touch sensing)

Occurs when a work instruction is completed and another work instruction is executed without a reset instruction.

Example:

1. AC JOINT SPEED9 ACCU4 TIMER0 MOTHER\_RESET
2. AC LINEAR SPEED9 ACCU4 TIMER0 **MOTHER\_WORK1**
3. AC LINEAR SPEED9 ACCU4 TIMER0
4. WS LINEAR SPEED9 TIMER0
5. WE LINEAR WELD\_CONDO
6. AC LINEAR SPEED9 ACCU4 TIMER0
7. WS LINEAR SPEED9 ACCU4 TIMER0 **MOTHER\_WORK1** (error occurs at this step)

⇒ *Add a reset instruction before the next work instruction.*

Example:

6. AC LINEAR SPEED9 ACCU4 TIMER0 **MOTHER\_RESET**
7. WS LINEAR SPEED9 ACCU4 TIMER0 MOTHER\_WORK1

---

## TROUBLESHOOTING

**ERROR CODE E6514**      Work specification incorrect.  
(Touch sensing)

Occurs when a previous work instruction is not completed before another work instruction is executed.

Example:

1. AC JOINT SPEED9 ACCU4 TIMER0 MOTHER\_RESET
2. AC LINEAR SPEED9 ACCU4 TIMER0 **MOTHER\_WORK2**
3. AC LINEAR SPEED9 ACCU4 TIMER0
4. AC LINEAR SPEED9 ACCU4 TIMER0 **MOTHER\_WORK1** (error occurs at this step)

⇒ *Add the required steps in the program to complete the first work instruction before another work instruction is executed.*

Example:

4. AC LINEAR SPEED9 ACCU4 TIMER0 **MOTHER\_WORK2**
- 

**ERROR CODE E6515**      Incorrect sensing point specified.  
(Touch sensing)

Occurs when points are taught in incorrect order.

Example:

points should be taught in order A1, B1, A2, B2, A3, B3.

Occurs when the distance between two points taught on the same check plane is 10 mm, or less, or the angle, between the two sensing surfaces, is out of range (30 to 150 degrees).

⇒ *Reteach points to comply with parameters described above.*

---

---

## TROUBLESHOOTING

**ERROR CODE E6516** Wire check failure.  
(Touch sensing)

Main causes include:

1. The position of a taught point is recorded too far from the workpiece, and the wire tip did not touch the work within the allowed time.
2. The weld wire is not sent due to the welding unit power off etc.

⇒ *Reteach point at the correct distance.*

⇒ *Ensure workpiece is within specifications and is properly placed.*

⇒ *Check the welding machine for power and press CYCLE START to manually feed wire for five seconds.*

⇒ *Check the wire supply, wire feeder, and welding equipment and repair/replace as necessary.*

---

**ERROR CODE E6517** incorrect weld condition number.

The weld condition number, is not within the acceptable range (1–20).

Example: W1SET 100=60, 250, 28, 2, 3 Weld condition 100 is out of range (1–20).

⇒ *Set weld condition within range.*

Example: W1SET 1=60, 250, 28, 2, 3

---

**ERROR CODE E6518** No weld condition data set.

Weld data is not set in the weld condition number specified.

Example: Weld condition 1 is not set for LWC #a1, 1

⇒ *Ensure weld data is set in the specified weld condition number used.*

Example: W1SET 1=60, 250, 28, 2, 3

---

## TROUBLESHOOTING

**ERROR CODE E6519** Weld condition data out of range.

Ensure data is within range as shown below.

Current:	0–999 Amp
Voltage:	0–99.9 Volt
Speed:	0–999 cm/min
Time:	0–9.9 second
Weaving width:	0–40.0 mm
Weaving frequency:	0–4.0 Hz
Weaving pattern:	0–9

⇒ *Correct weld condition data as necessary.*

---

**ERROR CODE E6520** Laser sensor tracking value exceeded.

Tracking deviation exceeds the allowed threshold value to permit welding, and continues to exceed the value longer than time allowed for normal operation.

Main causes include:

1. Workpiece is improperly placed.
2. Error check value is set too low.

⇒ *Ensure the workpiece is properly placed.*

⇒ *Ensure the error check value is set correctly.*

---

**ERROR CODE E6521** Beyond laser sensor tracking ability.

The difference between the over-tracking ability detection start value and the current over-tracking value, exceeds the threshold value set.

Main causes include:

1. Workpiece is improperly placed.
2. Error check value is set too low.

⇒ *Ensure the workpiece is properly placed.*

⇒ *Ensure the error check value is set correctly.*

---



---

## TROUBLESHOOTING

**ERROR CODE E6522** Laser sensor cannot detect welding joint.

Main causes include:

1. The laser sensor unable to find a groove.
2. The laser sensor detects a groove that does not match the specified groove number data.
3. The laser sensor controller EMERGENCY STOP switch is pressed.
4. Incorrect laser sensor settings or defective laser sensor.

⇒ *Re-teach the groove data.*

⇒ *Ensure the correct groove number is specified.*

⇒ *Release the laser sensor controller EMERGENCY STOP switch.*

⇒ *Refer to the laser sensor operation manual and ensure correct set-up and operation procedures are used.*

---

**ERROR CODE E6523** Calibration data between torch and camera is not ready.

Calibration data is not set (LTCALIB command).

⇒ *Set the calibration data using the LTCALIB command.*

---

**ERROR CODE E6524** Error in data calculated using laser sensor.

Processing based on laser sensor data could not be calculated.

⇒ *Readjust the laser sensor so 80 percent or more of grooves are correctly detected.*

⇒ *If the error cannot be reset after laser sensor readjustment, contact KRI customer service.*

---

**ERROR CODE E6525** Cannot detect weld joint, laser sensor tracking set already.

Main causes include:

1. A PC program executes a function, such as LSEN, during execution of a program using a laser sensor.
2. During execution of a function, such as the LSEN, a program using a laser sensor is executed.

⇒ *Correct program data so the laser sensor is not used by two instructions at the same time.*

---

---

## TROUBLESHOOTING

**ERROR CODE E6526** No response from laser sensor controller.

Main causes include:

1. Disconnected or defective laser sensor harness.
2. Incorrect laser sensor settings or defective laser sensor.

⇒ *Check laser sensor, laser sensor harness and connections and repair/replace as necessary.*

⇒ *Refer to the laser sensor operation manual and ensure correct set-up and operation procedures are used.*

---

**ERROR CODE E6527** Laser sensor communication error. Code is XX.

Incorrect laser sensor settings or defective laser sensor.

⇒ *Refer to the laser sensor operation manual for sub-code XX and ensure correct set-up and operation procedures are used.*

---

**ERROR CODE E6528** Start point not found by laser sensor.

Main causes include:

1. The laser sensor unable to find a groove.
2. The laser sensor detected a groove that does not match the specified groove number data.
3. The laser sensor controller EMERGENCY STOP switch is pressed.
4. Incorrect laser sensor settings or defective laser sensor.

⇒ *Re-teach the groove data.*

⇒ *Ensure the correct groove number is specified.*

⇒ *Release the laser sensor controller EMERGENCY STOP switch.*

⇒ *Refer to the laser sensor operation manual and ensure correct set-up and operation procedures are used.*

---

---

## TROUBLESHOOTING

**ERROR CODE E6529** Finish point not found by laser sensor.

Main causes include:

1. The laser sensor unable to find a groove.
2. Auto tracking function is enabled with no data present, and finish point detection failed.

⇒ *Re-teach data, or readjust the detection range for the finish point.*

⇒ *Disable auto tracking function ID because there is no data, and re-execute finish point detection.*

---

**ERROR CODE E6530** Cannot use circular interp. with laser sensor function.

Laser sensor tracking function is used with circular interpolation.

⇒ *Do not use circular or linear interpolation with laser sensor tracking function.*

---

**ERROR CODE E6531** Cannot turn laser ON because motor power is OFF.

Attempt to use laser sensor when motor power is OFF.

⇒ *Set motor power ON and re-execute.*

---

**ERROR CODE E6532** No communication board to laser sensor.

The laser sensor 1HA communication board is not installed.

⇒ *Ensure the laser sensor 1HA communication board is properly installed.*

---

---

## TROUBLESHOOTING

### **ERROR CODE E6533** No RTPM board.

Main causes include:

1. The software for RTPM option is installed, but the hardware (1FH board) is not installed properly.
2. Hardware for RTPM (1FH board) is installed, but the software for RTPM option is not installed.
2. The software and hardware (1FH board) are installed, but controller power was not cycled OFF and ON after RTPM option is set-up.

⇒ *Ensure the 1FH board is properly installed.*

⇒ *Reseat the 1FH board and connectors.*

⇒ *Perform RTPM option set-up procedure and cycle controller power OFF and ON.*

---

### **ERROR CODE E6534** Too many taught points for RTPM.

Occurs when the number of taught points, between the weld start point and the weld end point, exceeds 127 points

⇒ *Reteach program points, not to exceed 127 RTPM points.*

---

### **ERROR CODE E6535** RTPM arc sensor error.

Exceeded the number of weaves set for arc sensor fault detection, and the lateral (+) and (-) values for current are less than 10 A, more than 490 A, or the difference is 0.2 A, or less.

Main causes include:

1. Weld start-point is too far from the groove.
2. Defective weld controller/timer, or weld controller/timer set OFF.

⇒ *Ensure the wiring for the current sensor for RTPM is not loose or disconnected.*

⇒ *Ensure the weld start-point is taught in the welding groove.*

⇒ *Ensure the welder is powered-up and in normal operating condition.*

⇒ *Weld with RTPM disabled, check for problems with the weld controller/timer and repair/replace as necessary.*

---

---

## TROUBLESHOOTING

### **ERROR CODE E6536**      RTPM current deviation error.

Occurs when actual current exceeds commanded current (feedback current) for a time period exceeding the current deviation error time-out value.

Main causes include:

1. Weld start-point is too far from the groove.
2. Defective weld controller/timer, or weld controller/timer set OFF.
3. Incorrect linearization or offset/gain.

- ⇒ *Ensure the weld start point is taught in the welding groove.*
  - ⇒ *Set controller power to OFF and reseal the 1FH board and the 1FH board connectors.*
  - ⇒ *Ensure the welding unit power is ON and in proper operating condition.*
  - ⇒ *Ensure the RTPM function is activated.*
  - ⇒ *Ensure the welding unit metered current, during a continuous bead, is the same as the commanded current.*
  - ⇒ *Ensure values set for linearization or offset/gain are correct.*
  - ⇒ *Weld with RTPM disabled, and check for problems with the weld controller/timer and repair/replace as necessary.*
- 

### **ERROR CODE E6537**      RTPM tracking value is out of range.

Occurs when the deviation detection value exceeds the error check value set in RTPM, continuously, exceeding the number of times allowed.

Main causes include:

1. Weld start-point is too far from the groove.
2. Defective weld controller/timer, or weld controller/timer set OFF.
3. The deviation error detection value is set too low.

- ⇒ *Ensure the weld start point is taught in the welding groove.*
  - ⇒ *Weld with RTPM disabled, and check for problems with the weld controller/timer and repair/replace as necessary.*
  - ⇒ *If the welding groove is being tracked normally, the deviation error detection value may be set too low. Increase the value.*
-

---

## TROUBLESHOOTING

### **ERROR CODE E6538**      Beyond RTPM tracking ability.

Occurs when the current tracking value exceeds the threshold value and the number of times value set for RTPM tracking ability errors.

Example:

If the threshold is set at 9 mm, and the number of times is set at 30, the error occurs after 30 weave cycles and the path deviates more than 9 mm from the original welding path.

Main causes include:

1. Weld start-point is too far from the groove.
2. Defective weld controller/timer, or weld controller/timer set OFF.
3. The deviation error detection value is set too low.

- ⇒ *Ensure the welding start point is taught in the groove. Starting outside the groove will cause this error.*
  - ⇒ *Execute a weld, without the RTPM function, to ensure the weld controller/timer is operating properly.*
  - ⇒ *Modify fixturing and/or part to minimize the required correction.*
  - ⇒ *Verify the linearization table is correct by comparing the current reading indicated on the weld controller/timer to the current value set in the weld condition number.*
  - ⇒ *If the welding groove is being tracked normally, the deviation error detection value may be set too low. Increase the value.*
- 

### **ERROR CODE E6539**      AVC tracking value is out of range.

The tracking deviation value, used as the threshold for error detection, is exceeded continuously.

Main causes include:

1. Weld start-point is too far from the groove.
2. Defective weld controller/timer, or weld controller/timer set OFF.
3. The deviation error detection value is set too low.

- ⇒ *Ensure the welding start point is taught in the groove. Starting outside the groove will cause this error.*
  - ⇒ *Execute a weld with AVC disabled, to ensure the weld controller/timer is operating properly.*
  - ⇒ *If the welding groove is being tracked normally, the deviation error detection value may be set too low. Increase the value.*
-

---

## TROUBLESHOOTING

### **ERROR CODE E6540**      Beyond AVC tracking ability.

Occurs when the current tracking value exceeds the threshold value and the number of times value set for RTPM tracking ability errors.

Main causes include:

1. Weld start-point is too far from the groove.
2. Defective weld controller/timer, or weld controller/timer set OFF.
3. The deviation error detection value is set too low.

⇒ *Ensure the welding start point is taught in the groove. Starting outside the groove causes this error.*

⇒ *Execute a weld with AVC disabled, to ensure the weld controller/timer is operating properly.*

⇒ *If the welding groove is being tracked normally, the deviation error detection value may be set too low. Increase the value.*

---

### **ERROR CODE E6541**      No AVC board.

Main causes include:

1. AVC (1FH) board is not installed onto the 1KA board.
2. Controller power is not cycled OFF and ON after setting specifications.

⇒ *Ensure the AVC (1FH) board is properly installed.*

⇒ *Replace the AVC board.*

⇒ *Cycle controller power OFF and ON after setting specifications.*

---

### **ERROR CODE E6542**      AVC voltage deviation error.

During AVC function execution, the reference voltage and/or feedback voltage exceeds the threshold value specified for over-voltage detection.

Main causes include:

1. Defective weld controller/timer, or weld controller/timer set OFF.
2. Defective harness or harness connections.

⇒ *Execute a weld with AVC disabled to ensure the weld controller/timer is operating properly.*

⇒ *Check the voltage sensing device and harness, and repair/replace as necessary.*

---

---

## TROUBLESHOOTING

**ERROR CODE E6543** Too many taught points for AVC.

Occurs when the number of taught points between the weld start point and the weld end point exceeds 127 points.

⇒ *Reteach program points, not to exceed 127 RTPM points.*

---

**ERROR CODE E6562** Electric pole stuck.

The electrode is stuck to the base metal during TIG welding.

⇒ *Cut the electrode.*

⇒ *Change weld conditions if problem occurs frequently.*

---

**ERROR CODE E7000** Servo weld gun disconnect.

When a welding step is executed the servo spot weld gun is not connected.

⇒ *Connect the servo spot weld gun and re-execute.*

---

**ERROR CODE E7001** Location data includes released gun status data.

The servo weld gun axis position value data indicates the gun is disconnected.

⇒ *Use the correct gun disconnect procedure.*

---

**ERROR CODE E7002** Destination is far from target point.

Program point is too far from the taught point.

⇒ *Contact KRI customer service (include operating conditions/settings at the time the error occurred).*

---



## TROUBLESHOOTING

**ERROR CODE E8200**      Not in cooperative mode.

Cooperative motion instruction is taught before MASTER/SLAVE instruction or after ALONE instruction.

⇒ *Use cooperative motion instructions between MASTER/SLAVE instruction and ALONE instruction.*

---

## TROUBLESHOOTING

### 1.3.2.3 PXXXX OPERATION ERROR CODES

**ERROR CODE P0100** Illegal input data.

AS Language command/instruction does not comply with AS Language syntax.

⇒ *Enter AS Language command/instruction in correct AS Language syntax.*

---

**ERROR CODE P0101** Too many arguments.

AS Language command/instruction exceeds the number of user specified items allowed by the format.

⇒ *Enter AS Language command/instruction in correct AS Language syntax and format for the command/instruction used.*

---

**ERROR CODE P0102** Input data is too big.

AS Language command/instruction data exceeds the allowable range.

⇒ *Enter data that is within acceptable range.*

---

**ERROR CODE P0103** Illegal PC number.

PCEND command/instruction specified a PC program number that is out of the allowable range.

⇒ *PC program number must be -1 or 1–5.*

Example: PCEND 2

---

**ERROR CODE P0104** Illegal robot number.

A robot number is specified that exceeds the number of robots connected to the controller.

Example: "LLIMIT 3" is entered when 2 robots are connected to the controller.

⇒ *Ensure robot number does not exceed the number of robots connected to controller.*

Example: "LLIMIT 2" can be used when 2 robots are connected to the controller.

---

---

## TROUBLESHOOTING

**ERROR CODE P0106** Illegal priority.

Priority level designation is out of the allowable range (1–127).

Example: LOCK 128

⇒ *Ensure the correct priority level number is entered (1–127).*

*Example: LOCK 2*

---

**ERROR CODE P0107** Invalid coordinate value.

Upper limit value is less than lower limit value for work space output data.

⇒ *Enter the correct upper limit coordinates.*

---

**ERROR CODE P0108** Syntax error.

Occurs when an AS Language command is entered that does not follow the correct syntax.

⇒ *Correct the syntax, format or spelling of the command/instruction.*

---

**ERROR CODE P0109** Invalid statement.

Main causes include:

1. An AS Language command is entered that has typing errors, incorrect spelling or is in the wrong format.
2. An existing variable name, that is already used for a variable of a different type, is used.

⇒ *Correct the syntax, format or spelling of the command/instruction.*

⇒ *Do not use existing variable names.*

---

**ERROR CODE P0110** Specify full spelling of command.

Displayed when an abbreviation is entered incorrectly or has missing letters.

⇒ *Enter the correct abbreviation or use the full spelling of the command.*

---

---

## TROUBLESHOOTING

**ERROR CODE P0111** Cannot use this command/instruction in current mode.

The command/instruction entered could not be executed in the selected mode.

Example: "EDIT" is entered in the program edit mode (used in monitor mode).

Example: "TERMOFF" is entered from the teach pendant keyboard (used from a PC terminal).

⇒ *Ensure correct mode is selected.*

---

**ERROR CODE P0114** Illegal expression.

A command/instruction is entered that does not comply with AS Language syntax or format.

Example: "DO HERE" the DO command cannot be used with the HERE command/instruction.

⇒ *Ensure correct syntax and format are used.*

Example: "HERE point1" is correct and does not return an error.

---

**ERROR CODE P0115** Illegal function.

Occurs when functions are used to assign values to variables, but the data is incompatible.

Example: "POINT #a=SQRT(y)" returns an error.

⇒ *Ensure function is compatible with variables.*

Example: "x=SQRT (y)" is correct and does not return an error.

---

**ERROR CODE P0116** Illegal argument of function.

Function parameter does not comply with AS Language syntax.

Example: "x=SQRT" returns and error.

⇒ *Use correct syntax and format for functions and arguments.*

Example: "x=SQRT(3)" is correct and does not return and error.

---

## TROUBLESHOOTING

**ERROR CODE P0117** Invalid variable (or program) name.

Displayed when illegal variable or program name is entered from the editor or monitor modes.

Example: "JM ##a" too many precision point symbols.

Example: "CALL #a" is not an acceptable program name.

⇒ *Ensure program names and variables are defined correctly.*

---

**ERROR CODE P0118** Illegal variable type.

Displayed when illegal variable is entered from editor or monitor modes.

Example: "b = #a + b" cannot combine location and real variables using an arithmetic operator.

⇒ *Use compatible variable type for commands or instructions.*

---

**ERROR CODE P0119** incorrect array suffix.

Main causes include:

1. An array is entered that does not comply with AS Language syntax or array format.  
Example: "point[1.2.]=1" returns an error.
2. A previously defined variable or array name is used to define a new array name.  
Example: "HERE a" is entered then "HERE a[1]" is entered. An error is returned because location variable "a" is already used.

⇒ *Enter the array in compliance with AS Language syntax and array format.*

Example: "point[1.2]=1" is correct and does not return an error.

⇒ *Change the previously defined variable name.*

---

**ERROR CODE P0120** Incongruent num. parenthesis.

Occurs when parentheses are not entered as a pair, containing both a left and right parenthesis.

⇒ *Enter parentheses in left and right pairs.*

---

## TROUBLESHOOTING

**ERROR CODE P0121** Expected to be a binary operator.

A non-binary operator has been entered where a command expected a binary operator.

⇒ *Enter a binary operator.*

---

**ERROR CODE P0122** Illegal constant.

A variable, or a non-constant, is used where a constant or integer should be used with a monitor command.

Example: "WHERE a" Should be WHERE 1 ... WHERE 6.

⇒ *Use the proper constant or integer with the command. See the D Series Controller AS Language Reference Manual for more information.*

---

**ERROR CODE P0123** Illegal qualifier.

Displayed when monitor commands are followed by unexpected qualifiers.

Example: "LIST W" expected characters include P, L, and R for program, location, and real variables; "W" causes error.

⇒ *Enter qualifiers in compliance with AS Language syntax and format.*

---

**ERROR CODE P0124** Invalid label.

Occurs in the editor mode when a GOTO instruction is combined with a reserved character.

Example: "GOTO #a" returns an error because "#" is a reserved character.

⇒ *Do not use reserved characters in label identification.*

---

**ERROR CODE P0125** Missing expected character.

Occurs when commands or instructions are entered with an incorrect format.

Example: "TOOL a=b", "=b" causes an error, "TOOL a" would be correct.

⇒ *Use correct syntax and format for commands and instructions.*

---

---

## TROUBLESHOOTING

**ERROR CODE P0126** Illegal switch name.

Displayed when a system switch is incorrectly identified.

Example: "SWITCH light" there is no system switch named "light".

⇒ *Use valid switch names.*

---

**ERROR CODE P0127** Specified switch name needs full spelling.

System switch name entered does not comply with AS Language syntax.

Example: "SWITCH ERR" returns an error.

⇒ *Use system switch names in compliance with AS Language syntax.*

Example: "SWITCH ERROR" is correct and does not return an error.

---

**ERROR CODE P0128** Illegal format specifier.

Occurs when the TYPE or PRINT command is not used with an acceptable format portion of the instruction.

Example: "PRINT/A" returns an error

⇒ *Use only specified format instructions with TYPE and PRINT commands.*

Example: "PRINT/D" is correct and does not return an error

---

**ERROR CODE P0129** Duplicate statement label.

Main causes include:

1. A previously used label is used the second time in the same program.
2. When transferring or copying a program, the same label name is used in the source and destination programs.

⇒ *Use label names only once per program.*

---

**ERROR CODE P0130** Cannot define as array.

A program name is assigned as an array variable.

Example: "EDIT test[1]" returns an error.

⇒ *Enter program names in compliance with AS Language syntax and format.*

Example: "EDIT test1" is correct and does not return an error.

---

---

## TROUBLESHOOTING

**ERROR CODE P0131** No. of dimension in array exceeds 3.

Attempted to create an array variable with more than 3 dimensions.

Example: "point[3,5,7,9]=1" returns an error.

⇒ *Use 3 or less dimensions (elements) in an array.*

Example: "point[1,2,3]=1" is correct and does not return an error.

---

**ERROR CODE P0132** Array variable already exists.

Attempted to create an array variable with a different number of dimensions (elements) with the same name as an existing array variable .

Example: If array variable "test[1]" exists, an array variable "test[1,2]" cannot be defined.

⇒ *Confirm array variable exists. Select new name for the array variable with a different number of dimensions (elements).*

Example: "sample[1,2]"

---

**ERROR CODE P0133** Non array variable exists.

Attempted to create an array variable with the same name as an existing real variable.

Example: "x=1" is entered, then "y=x[1]" is entered and an error is returned because real variable "x" already exists.

⇒ *Confirm real variable exists. Select new name for array variable.*

---

**ERROR CODE P0134** Array variable expected.

A real value array name is not used as the array variable for a DECOMPOSE instruction.

Example: "DECOMPOSE x=point" returns an error.

⇒ *Enter real value array name in compliance with AS Language syntax and format.*

Example: "DECOMPOSE x[1]=point" is correct and an error is not returned.

---



---

## TROUBLESHOOTING

### **ERROR CODE P0135** Local variable expected.

A global variable is used when defining a temporary argument for a subroutine.

Example: "SUB(a)" returns an error.

⇒ *Use a local variable when defining a temporary argument for a subroutine.*

Example: "SUB(.a)" is correct and does not return an error.

---

### **ERROR CODE P0136** Unexpected suffix.

An array with a suffix is used when defining a temporary argument for a subroutine.

Example: "sub(.a[3])" returns an error.

⇒ *Enter the temporary argument in compliance with AS Language syntax and format.*

Example: "sub.a" is correct and does not return an error.

---

### **ERROR CODE P0137** Mismatch of arguments at subroutine call.

The number of arguments between the source program and the destination program do not match.

Example: Source: "SUB(.a)"; Destination: "SUB(.a,b)" returns an error.

⇒ *Ensure the number of arguments between the source program and the destination program match.*

---

### **ERROR CODE P0138** Mismatch of argument type at subroutine call.

At a subroutine call, the type of real value argument is different than the type of temporary argument defined.

Example: "CALL sub(1)" returns an error.

⇒ *Correct the type of the argument in the called program or origin program.*

Example: "CALL sub1" is correct and does not return an error.

---

## TROUBLESHOOTING

**ERROR CODE P0139** Illegal control structure.

Main causes include:

1. In a control structure CASE is the last step, or VALUE, END, or ANY are missing after CASE.
2. Destination step for structure instruction is missing.

⇒ *Use correct syntax and components in control flow structures.*

---

**ERROR CODE P0140** Step:XX Wrong END statement.

Occurs when an illegal END statement is entered during editing.

⇒ *Use correct syntax and components in control flow structures.*

---

**ERROR CODE P0141** Step:XX Extra END statement.

Occurs when an extra END statement is present and there is no corresponding structure.

⇒ *Use correct syntax and components in control flow structures, check structure of END statements.*

---

**ERROR CODE P0142** Step:XX Cannot terminate DO with END.

This error is displayed when the control flow structure DO....UNTIL is entered with an END statement.

⇒ *Use correct syntax and components in control flow structures.*

---

**ERROR CODE P0143** Step:XX No VALUE statement after CASE.

Occurs when the control flow structure CASE OF....END is entered without a value to evaluate.

⇒ *Use correct syntax and components in control flow structures.*

---

---

## TROUBLESHOOTING

**ERROR CODE P0144**      Step:XX Preceding IF missing.

Displayed when control flow structure does not contain the correct structure for IF...THEN... ELSE...END commands.

⇒ *Use correct syntax and components in control flow structures.*

---

**ERROR CODE P0145**      Step:XX Preceding CASE missing.

Displayed when control flow structure does not contain the correct structure for CASE...OF... VALUE...ANY...END commands.

⇒ *Use correct syntax and components in control flow structures.*

---

**ERROR CODE P0146**      Step:XX Preceding DO missing.

Displayed when control flow structure does not contain the correct structure for DO...UNTIL.

⇒ *Use correct syntax and components in control flow structures.*

---

**ERROR CODE P0147**      Step:XX Cannot find END of XX.

Occurs when control flow structure that requires an END statement does not contain the necessary END.

⇒ *Use correct syntax and components in control flow structures.*

---

**ERROR CODE P0148**      Step:XX Too many control structures.

Occurs when 10 layers of control flow structure are exceeded.

⇒ *Limit control flow structure to 10 layers.*

---

---

## TROUBLESHOOTING

**ERROR CODE P0149** Variable (or program) already exists.

The name of a program, loaded from floppy disk or PC card using the LOAD command, already exists in the system memory. This error is not used in the spot welding application.

- ⇒ *Change the name of the program currently in system memory.*
  - ⇒ *Delete the program in system memory, if not needed.*
- 

**ERROR CODE P0150** Variable of different type already exists.

Displayed when a variable is entered that is already in the system memory.  
Example: A location named “weld1” is entered when a program named “weld1” is already in the memory.

- ⇒ *Do not use variable names for more than one item.*
- 

**ERROR CODE P0151** Internal buffer over due to complicated expression.

Main causes include:

1. An expression is entered that is too complicated.
2. Too many arguments for a command/instruction.  
Example: “LIST/PPPPPP” returns an error.
3. More than twenty six arguments are specified in one subroutine.

- ⇒ *Rewrite to reduce the complexity of the expression.*
  - ⇒ *Ensure the argument for the command/instruction is correct.*  
Example: “LIST/P” is correct and does not return an error.
  - ⇒ *Do not use more than twenty six arguments in a subroutine.*
- 

**ERROR CODE P0152** Undefined Variable (or program).

Attempt to call a subroutine, or process a variable, that does not exist.  
Example: “LIST/P test” is entered, but program test does not exist.

- ⇒ *Verify the variable or program exists.*
-

---

## TROUBLESHOOTING

**ERROR CODE P0153**      Illegal clock value.

Time or date is entered in the wrong format.

⇒ *Re-enter the values correctly; time—military, date—yy/mm/dd.*

---

**ERROR CODE P0154**      Missing “=”.

The argument is missing the necessary “=”.

Example: “XFER test sub” returns an error.

⇒ *Ensure command/instruction complies with AS Language syntax and format.*

Example: “XFER test=sub” is correct and does not return an error.

---

**ERROR CODE P0155**      Missing “)”.

The argument is missing the necessary “)”.

Example: “(.a” returns an error.

⇒ *Ensure command/instruction complies with AS Language syntax and format.*

Example: “(.a)” is correct and does not return an error.

---

**ERROR CODE P0156**      Missing “]”.

The argument is missing the necessary “]”.

Example: “\$line[2” returns and error.

⇒ *Ensure command/instruction complies with AS Language syntax and format.*

Example: “\$line[2]” is correct and does not return an error.

---

**ERROR CODE P0157**      Missing “TO”.

The argument is missing the necessary “TO”.

Example: “FOR test = 1 max.test” returns an error.

⇒ *Ensure command/instruction complies with AS Language syntax and format.*

Example: “FOR test = 1 TO max.test” is correct and does not return an error.

---

---

## TROUBLESHOOTING

### **ERROR CODE P0158** Missing "BY".

The argument is missing the necessary "BY".

Example: "POINT y = SHIFT (x 5,5,5)

⇒ *Ensure command/instruction complies with AS Language syntax and format.*

Example: "POINT y = SHIFT (x BY 5,5,5)

---

### **ERROR CODE P0159** Missing ":".

The argument is missing the necessary ":".

Example: "SEND 1 \$out,err" returns an error.

⇒ *Ensure command/instruction complies with AS Language syntax and format.*

Example: "SEND 1: \$out,err" is correct and does not return an error.

---

### **ERROR CODE P0160** Specify "ON" or "OFF".

The command/instruction does not comply with AS Language syntax or format.

Example: "TRACE 1 ON" returns an error.

⇒ *Ensure command/instruction complies with AS Language syntax and format.*

Example: "TRACE 1:ON" is correct and does not return an error.

---

### **ERROR CODE P0161** Robot num. must be specified.

This error occurs when the robot number is omitted from the syntax of an AS Language command which requires the robot number as an argument.

Example: "HERE P" returns an error.

⇒ *Include the robot number as an argument as required.*

Example: "HERE 1: P" is correct and does not return an error.

---

---

## TROUBLESHOOTING

**ERROR CODE P0162** Cannot modify position data in this instruction.

During modifying an AS Language program from the teach screen, pose data is modified at a step with a non-positional command/instruction.

Example: Trying to modify pose data, at a step with “DELAY 1” recorded, returns an error.

⇒ *Pose data can only be modified for AS Language program steps containing move instructions (JMOVE, LMOVE, etc.).*

---

**ERROR CODE P1000** Cannot execute program because motor power is OFF.

Program will not start because motor power is not ON.

⇒ *Set motor power ON.*

⇒ *Select repeat mode.*

⇒ *Set teach lock OFF.*

⇒ *Re-execute program.*

---

**ERROR CODE P1001** Cannot execute program in TEACH mode.

Programs cannot run in teach mode.

⇒ *Ensure that the controller is in REPEAT mode.*

⇒ *Defective TEACH/REPEAT switch.*

⇒ *Defective 1KA board.*

---

**ERROR CODE P1002** Cannot execute program because teach lock is ON.

Programs cannot run with the teach lock in the ON position.

⇒ *Set the TEACH LOCK switch OFF and execute the program again in repeat mode.*

⇒ *Defective teach pendant or 1KA board.*

---

---

## TROUBLESHOOTING

**ERROR CODE P1003** Cannot execute a program because of EXT.HOLD input.

An attempt to cycle start a program is made while external hold signal is ON.

- ⇒ Release the external hold and re-execute cycle start.
- ⇒ Verify dedicated input signals in AUX 0601 match signals programed from the PLC in the Slogic program.
- ⇒ If the external hold signal is not needed, change the signal setting in AUX 0601 from set to reset.

### NOTE

With cycle start switch set OFF in AUX 0502, cycle start is kept ON if external hold is applied; program execution resumes once external hold is released.

---

**ERROR CODE P1004** Cannot execute program being reset.

This error occurs when a cycle start signal is received during a program reset.

- ⇒ Adjust the timing of the program reset and the cycle start signals.

---

**ERROR CODE P1006** Cannot execute program because of EXT.START DIS-  
ABLE.

This error occurs when the external cycle start signal is received with the EXT.START dedicated signal OFF.

- ⇒ Release the EXT.START dedicated signal in AUX. 0601 Dedicated Input Signal.
  - ⇒ The EXT.START dedicated signal must be ON when the external cycle start signal is received.
  - ⇒ Use the external cycle start dedicated input signal to execute the robot program.
-



---

## TROUBLESHOOTING

**ERROR CODE P1009** Program is already running.

Main causes include:

1. An attempt is made to edit or execute a program that is running.
2. SYSINIT command is executed while a program is running.

⇒ *Stop the robot control program prior to editing or checking.*

⇒ *Stop the robot control program prior to executing the SYSINIT command.*

---

**ERROR CODE P1010** Robot control program is already running.

Occurs when an attempt is made to execute a DO, TOOL, or BASE command when a robot control program is running.

⇒ *Wait for the robot control program to complete execution.*

⇒ *Stop the robot control program.*

---

**ERROR CODE P1011** Cannot continue this program. Use EXECUTE.

After a program is executed the specified number of times in repeat mode, the CONTINUE command is entered or the CYCLE START switch is pressed.

⇒ *The CONTINUE command or CYCLE START switch cannot be used at this time, use the EXECUTE command to start the program.*

⇒ *Re-select the program and press the CYCLE START switch.*

---

**ERROR CODE P1012** Robot is moving now.

Displayed if any of the following commands are entered while a program is running: EXECUTE, CONTINUE, TOOL, BASE, DO, SYSINIT or CYCLE START.

⇒ *Stop the program or confirm the operation to be performed.*

---

**ERROR CODE P1013** Cannot execute because in error now. Reset error.

Occurs when attempt is made to start robot motion before an error has been cleared.

⇒ *Clear any errors and re-enter the command.*

---

---

## TROUBLESHOOTING

**ERROR CODE P1014** Cannot execute because program already in use.

An attempt to execute the same program using the EXECUTE and PCEXECUTE is made.

⇒ *Allow the program to complete executing and re-execute.*

---

**ERROR CODE P1015** Cannot delete, in use by another command.

Cannot COPY, DELETE or XFER command because program is being edited or executed.

⇒ *Complete program editing before using COPY, DELETE or XFER commands.*

⇒ *Allow program execution to complete before using COPY, DELETE or XFER commands.*

---

**ERROR CODE P1016** Cannot delete, used in program.

An attempt is made to delete a variable that is used in a program.

⇒ *Deletion of variables used in programs is not allowed by the AS system.*

---

**ERROR CODE P1017** Cannot delete a program in Editor.

Attempting to delete a program that is open in editor mode.

⇒ *Exit editor mode, and then delete the selected program.*

---

**ERROR CODE P1018** KILL or PCKILL to delete program.

Occurs when an attempting to delete a program that is still on the stack (selected).

⇒ *Select another program or KILL/PC KILL the program, then delete.*

---

---

## TROUBLESHOOTING

**ERROR CODE P1019** PC program is running.

Occurs when a PC program is running and instructions are entered that are not allowed.

⇒ *Allow the PC program to complete execution and re-enter the instructions.*

⇒ *Stop the PC program and re-enter the instruction.*

---

**ERROR CODE P1020** Cannot operate because teach pendant in operation.

Functions cannot be performed on the personal computer while the teach pendant is in use.

⇒ *Perform functions on the PC after the teach pendant operation is completed.*

---

**ERROR CODE P1021** Cannot execute with DO command.

Displayed when the DO command is entered with an instruction that does not comply with AS Language syntax.

⇒ *Ensure command/instruction is in compliance with AS Language syntax and format.*

---

**ERROR CODE P1022** Cannot execute with MC instruction.

An improper MC instruction is entered.  
Example: MC DO HOME.

⇒ *The MC instruction is used with ABORT, CONTINUE, ERESET, EXECUTE, HOLD, and SPEED only.*

---

**ERROR CODE P1023** Cannot execute in Robot program.

MC or PCSCAN instruction is used in a robot program.

⇒ *MC or PCSCAN instructions are used in a PC programs only.*

---

---

## TROUBLESHOOTING

**ERROR CODE P1024** Statement cannot be executed.

Occurs when the AS Language instruction entered is not acceptable for the mode of operation.

Example: DO HOME is executed with TEACH LOCK ON.

⇒ *Use instructions and commands that are compatible with the selected mode.*

---

**ERROR CODE P1025** Cannot be executed, function not set.

An attempt is made to use a function that is not installed or set-up.

Example: Communication with 1GV board with data communication or I/O communication disabled.

⇒ *To add a function that is not set-up or installed contact KRI customer service.*

Example: For the above example, enable data communication or I/O communication.

---

**ERROR CODE P1026** Can't KILL program that is running.

Displayed when an attempt is made to KILL a program that is executing.

⇒ *Stop program execution with HOLD or ABORT commands before program is removed from the stack with a KILL command.*

---

**ERROR CODE P1027** Cannot edit program, TEACH LOCK is ON.

Programs cannot be edited if the TEACH LOCK switch is ON.

⇒ *Turn TEACH LOCK switch OFF.*

---

**ERROR CODE P1028** Cannot paste.

Occurs when the operator is executing the paste function and no data is stored in the paste buffer or the step(s) cannot be overwritten.

⇒ *Ensure steps are copied before paste operation is executed.*

⇒ *Ensure insertion point is correct or steps can be overwritten.*

---

---

## TROUBLESHOOTING

**ERROR CODE P1029** Program name not specified.

Displayed when no program is on the stack and the EDIT command is entered without specifying a program name.

⇒ *Specify the name of the program to edited.*

---

**ERROR CODE P1030** Program interlocked by other procedure.

The selected program is not recognized as a robot program or a PC program and is used by another part of the software.

⇒ *Initialize the system and reload the program.*

---

**ERROR CODE P1031** No free memory.

Main causes include:

1. Not enough free memory to edit or teach a program.
2. Too many paths registered for arc welding (900 paths allowed in database).

⇒ *Delete unused programs and variables, or, expand system memory to maintain the required capacity.*

⇒ *Store 900 or less arc welding paths in database.*

---

**ERROR CODE P1032** No program step.

The step specified for execution or copying does not exist in program.

⇒ *Select valid steps for execution.*

⇒ *Create step(s) in the program.*

---

**ERROR CODE P1033** Program name already exists.

When using the RENAME or COPY command a new program name must be specified. If an existing name is used this error is displayed.

⇒ *Specify unused program names when renaming or copying programs.*

⇒ *If not needed, delete the existing program with the name used.*

---

---

## TROUBLESHOOTING

**ERROR CODE P1034** This program is not editable.

The auto load measurement program cannot be edited.

⇒ *Use a program name that does not include the auto load measurement program name.*

---

**ERROR CODE P1035** Record inhibited. Set [record accept] and operate again.

Displayed when an attempt is made to enter data, but Inhibit Record in auxiliary function 0802 is set to inhibit.

⇒ *Change the setting of the Inhibit Record in AUX 0802.*

---

**ERROR CODE P1036** Program change inhibited. Set [Accept] and operate again.

Displayed when an attempt is made to enter data, but Program Change in auxiliary function 0802 is set to inhibit.

⇒ *Change the setting of the Program Change in AUX 0802.*

---

**ERROR CODE P1037** Program name cannot be called "calib\_load\_".

⇒ *Use a program name that does not include "calib\_load\_".*

---

**ERROR CODE P1038** Program does not exist.

Main causes include:

1. Non-existing program is selected.
2. Program check operation or cycle start is executed without a program selected.

⇒ *Select an existing program before executing program check or cycle start.*

---

---

## TROUBLESHOOTING

**ERROR CODE P1039** Teach pendant is not connected.

The “T” command is executed without the teach pendant connected.

⇒ *Install teach pendant and re-execute the “T” command.*

---

**ERROR CODE P1040** Cannot execute this command in I/F panel.

A monitor-command button is set-up on the I/F panel to execute a command that is not permitted from the I/F panel. When the monitor-command button is pressed this error is displayed.

⇒ *Use commands permitted for I/F panel use.*

---

**ERROR CODE P1041** Auto monitor command failure.

An error occurs when a command specified for the auto monitor command function is executed.

⇒ *Use the error cause stored in the error log as a troubleshooting aid.*

---

**ERROR CODE P1042** NUM program is running.

This error occurs when the NUM program is executed and the NUM program is already running.

⇒ *Allow the current program execution to complete before re-executing.*

---

**ERROR CODE P1043** Cannot execute in REPEAT mode.

Teach mode function is attempted in repeat mode.

⇒ *Ensure teach mode is selected when executing teach mode functions.*

---

**ERROR CODE P1044** Cannot execute on because motor power is ON.

An attempt is made to enable motion verification mode while motor power is ON.

⇒ *Set motor power OFF and re-execute.*

---

---

## TROUBLESHOOTING

**ERROR CODE P2000** Turn OFF motor power.

An attempt is made to execute an operation or command which is not permitted with motor power ON.

Example: ZZERO command.

⇒ *Turn motor power OFF and re-execute operation or command.*

---

**ERROR CODE P2001** Turn HOLD/RUN sw. to HOLD.

Occurs when an attempt to execute DO, STEP, MSTEP, CONTINUE, or EXECUTE command is made with the RUN/HOLD switch in the RUN position. Only applies if the CHECK.HOLD system switch is ON (AUX 0502).

⇒ *Turn the RUN/HOLD switch to HOLD position.*

---

**ERROR CODE P2002** There is no external axis.

External axis cooperative motion command is executed and external axis equipment is not installed.

⇒ *Enable option or contact customer service to install external axis option.*

---

**ERROR CODE P2003** Illegal positioner type.

An out of range value is used to specify the type of positioner for an external axis.

⇒ *Specify the positioner type with a value that is in range.*

---

**ERROR CODE P2004** Cannot change, user data already exist.

An attempt is made to change system data (number of axes, etc.) without deleting existing user data.

⇒ *Save user data to PC card or floppy disk and delete user data from system memory. Change system data and reload user data from PC card or floppy disk.*

---



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## TROUBLESHOOTING

**ERROR CODE P2006**      Option is OFF.

Selected option is set OFF (disabled) or is not installed.

⇒ *Enable option or contact KRI customer service to install option.*

---

**ERROR CODE P2007**      Cannot execute because executed by other device.

Occurs when the operator attempts to execute the same command from the KCWIN terminal and the teach pendant at the same time.

⇒ *Cannot execute commands from two devices at the same time.*

---

**ERROR CODE P2008**      Device is not ready.

This error occurs when the RS232C communication port is configured to be used with a PC and Host Communication (I) communication is attempted.

⇒ *Use the AS Language TERMOFF command to reconfigure the communication protocol.*

---

**ERROR CODE P2009**      Illegal file name.

This error occurs when a file name does not follow to the proper syntax during file save or load.

⇒ *The first character in a file name must be alphabetic.*  
⇒ *File names are limited to eight characters (excluding three character extension).*  
⇒ *File names cannot contain spaces.*

---

**ERROR CODE P2010**      Disk is not ready.

This error occurs when a floppy disk is not installed or is not readable.

⇒ *Ensure the floppy disk is properly installed in the drive unit.*  
⇒ *Ensure the floppy disk is not write protected.*  
⇒ *Defective floppy drive unit or defective 1KA board.*  
⇒ *Defective local bus harness.*

---

---

## TROUBLESHOOTING

**ERROR CODE P2011** Invalid disk format.

Incorrect disk format.

⇒ *Ensure the disk format is: 2HD, 1.44 MB or 1.25 MB.*

---

**ERROR CODE P2012** Disk is write protected.

This error occurs when attempting to write to a disk that is write protected.

⇒ *Disable the write protection on the floppy disk card.*  
⇒ *Defective floppy disk, floppy disk drive unit, or defective 1KA board.*  
⇒ *Defective local bus harness.*

---

**ERROR CODE P2013** Disk full.

This error occurs when attempting to write to a floppy disk that does not have enough free space to complete a save.

⇒ *Disable the write protection on the floppy disk.*  
⇒ *Use a floppy disk with free space available.*  
⇒ *Defective floppy disk, floppy disk drive unit, or defective 1KA board.*

---

**ERROR CODE P2014** Too many files.

This error occurs when the number of files on the floppy disk, or PC card, exceeds the maximum.

⇒ *Use a floppy disk with available free space.*  
⇒ *Defective floppy disk, floppy disk drive unit, or defective 1KA board.*  
⇒ *Defective local bus harness.*

---

**ERROR CODE P2015** Cannot write on read-only file.

An attempt is made to overwrite or delete a read-only file on a floppy disk or PC card.

⇒ *Change the file properties.*

---

---

## TROUBLESHOOTING

### **ERROR CODE P2016**      Cannot open the file.

The file cannot be opened with the SAVE or LOAD commands.

- ⇒ *Ensure the floppy disk is properly inserted into the floppy disk drive.*
  - ⇒ *Ensure an existing file name is used.*
  - ⇒ *Defective local bus harness.*
  - ⇒ *Defective floppy disk, floppy disk drive unit, or 1KA board.*
- 

### **ERROR CODE P2017**      Cannot close the file.

A file opened by the SAVE or LOAD command cannot be closed.

- ⇒ *If the file is opened using a PC, ensure proper connection with the controller.*
  - ⇒ *Defective local bus harness.*
  - ⇒ *Defective floppy disk, floppy disk drive unit, or 1KA board.*
- 

### **ERROR CODE P2019**      ADC function already in use.

This error occurs when a monitor command and a program command are executed for an ADC function at the same time.

- ⇒ *Do not execute a monitor command for an ADC function while a robot or process control program is executing an ADC function command.*
- 

### **ERROR CODE P2020**      Illegal device number.

For Host Communication I, the sensor port is specified as logical device number 1 or 7. The PC terminal port is specified as logical device number 2 or 8. This error occurs when a SEND command/instruction specifies an illegal device number.  
Example: SEND 3:\$out,err.

- ⇒ *Ensure an available device number is specified.*  
Example: SEND 1:\$out,err.
-

---

## TROUBLESHOOTING

### **ERROR CODE P2022**      Cannot use DOUBLE OX.

When DOUBLE type signals are used, if either output signal in the pair is set ON, the other is set to OFF. An instruction (BITS, PULSE, DLYSIG, etc.) to change the state of either output signal causes this error to occur.

⇒ *Ensure signals used with the BITS, PULSE, DLYSIG, etc. commands/instructions are not designated as DOUBLE OX.*

---

### **ERROR CODE P2023**      In cooperative mode.

Main causes include:

1. An EXECUTE, DO, PRIME, or PRESET command, or, a program selection, step selection, or external program reset command is executed during cooperative motion.
2. MASTER or SLAVE instruction is executed between MASTER and ALONE instructions in the MASTER robot program, or between SLAVE and ALONE instructions in the SLAVE robot program.

⇒ *Do not use EXECUTE, DO, PRIME or PRESET commands or program select, step select, or external program reset command during cooperative motion.*

⇒ *Correct the MASTER or SLAVE robot program as needed.*

---

### **ERROR CODE P2024**      Invalid coordinate value X.

This error occurs when the work space output signal lower X value is greater than the upper value in AUX 0403.

⇒ *Ensure upper and lower values are set correctly in AUX 0403.*

---

### **ERROR CODE P2025**      Invalid coordinate value Y.

This error occurs when the work space output signal lower Y value is greater than the upper value in AUX 0403.

⇒ *Ensure upper and lower values are set correctly in AUX 0403.*

---

---

## TROUBLESHOOTING

**ERROR CODE P2026** Invalid coordinate value Z.

This error occurs when the work space output signal lower Z value is greater than the upper value in AUX 0403.

⇒ *Ensure upper and lower values are set correctly in AUX 0403.*

---

**ERROR CODE P2027** Cannot use signal, already used in I/F panel.

This error occurs when a signal allocated for the I/F panel is used as an OX signal.

⇒ *Use a signal that is not allocated for the I/F panel.*

---

**ERROR CODE P2028** Arm ID board is busy.

This error occurs when the 1GV arm ID board is processing data when a flash memory access command is executed (MNTREC, MNTLOG, etc.).

⇒ *Execute the flash memory access command after the 1GV arm ID board completes processing the data.*

⇒ *Defective 1GV arm ID board.*

---

**ERROR CODE P2029** Axis setting data is incorrect.

The channel number for the external axis is set to a channel number already assigned to another axis in AUX 2001, External Axis Set.

⇒ *Ensure the correct channel number is set in AUX 2001 using the values from the original factory specification sheet.*

---

**ERROR CODE P2031** Deleted step was destination of Jump, Call instruction.

This error occurs when the destination step for a JUMP or CALL instruction specified by FN20, FN23, or FN26 is deleted.

⇒ *Teach a step at the JUMP destination.*

⇒ *Ensure the correct step is designated in FN20, FN23, or FN26.*

---

---

## TROUBLESHOOTING

**ERROR CODE P2032**      Incorrect number input as WHERE parameter.

Occurs if a numeric value entered with the WHERE command is not in the acceptable range.

Example: WHERE 100.

⇒ *Ensure that data is within acceptable range.*

Example: WHERE 1.

---

**ERROR CODE P2033**      Logging is running.

This error occurs when a robot program or a PC program executes the SETTRACE or RESTRACE commands during LSTRACE command execution.

⇒ *Execute SETTRACE or RESTRACE after logging is completed.*

⇒ *Turn off trace functions in all robot and PC programs.*

---

**ERROR CODE P2034**      Undefined memory.

This error occurs when the TRACE ON command is executed before securing the memory address with the SETTRACE command.

⇒ *Secure the memory address with the SETTRACE command.*

---

**ERROR CODE P2035**      Non data.

This error occurs when the ZMNTCLEAR instruction is executed for a number of maintenance log entries greater than the number of entries in the maintenance log.

⇒ *Use the MNTLOG command or AUX 123-2 to display and confirm the number of maintenance log entries.*

---

**ERROR CODE P2038**      Matrix Calculation Error.

An error occurred in a software calculation.

Example: The three points for creating an arc path are on the same line in the CSHIFT function.

⇒ *Make necessary corrections and recalculate value.*

---

---

## TROUBLESHOOTING

**ERROR CODE P2039** Cannot start cycle from FN instruction.

This error occurs when an FN instruction is the first step at cycle start.

⇒ *Do not execute cycle start at a step containing an FN instruction.*

---

**ERROR CODE P2040** Card is not ready.

The controller tried to read the PC card, but the PC card is not inserted.

⇒ *Insert PC card and re-execute.*

---

**ERROR CODE P2041** Wrong card loaded.

The PC card inserted in the controller cannot be used or is defective.

⇒ *Insert a usable PC card.*

---

**ERROR CODE P2042** Card is write-protected.

An attempt is made to overwrite or delete data on a PC card that is write-protected.

⇒ *Remove write-protection and re-execute.*

---

**ERROR CODE P2043** Card battery is low voltage.

An attempt is made to access a PC card with low battery voltage.

⇒ *Replace card battery and re-execute.*

---

**ERROR CODE P2044** Card is not formatted.

An attempt is made to access a PC card that is not formatted.

⇒ *Insert a formatted PC card.*

⇒ *Use AUX 0204 to format the SRAM PC card.*

---

---

## TROUBLESHOOTING

**ERROR CODE P2045** Cannot format this card.

An attempt is made to format a non-SRAM PC card.

⇒ *Use a PC to format a non-SRAM card.*

---

**ERROR CODE P2046** Card initialization error.

PC card format failed.

⇒ *Re-execute PC card format.*

⇒ *If the error recurs, use another PC card.*

---

**ERROR CODE P2047** File is already open.

An attempt is made to open a file that is already open.

⇒ *Cycle controller power OFF and ON and re-execute.*

⇒ *If this error recurs, replace the 1KA/1KF boards or harness.*

---

**ERROR CODE P2048** File does not exist in card.

Non-existing file is specified for loading or deleting from a PC card.

⇒ *Ensure an existing file name is used.*

---

**ERROR CODE P2049** Attempted to open too many files.

An attempt is made to open a file while another file is open.

⇒ *Cycle controller power OFF and ON and re-execute.*

⇒ *If this error recurs, replace the 1KA/1KF boards or harness.*

---

**ERROR CODE P2050** Unexpected error during card access.

An unregistered error occurred.

⇒ *Cycle controller power OFF and ON and re-execute.*

⇒ *If this error recurs, replace the PC card, 1KA/1KF boards, or harness.*

---



---

## TROUBLESHOOTING

**ERROR CODE P2051** Illegal sequence numbers for file I/O data.

During data transfer between the 1KA and 1KF boards, the response from the 1KF board does not conform to the request from the 1KA board.

- ⇒ *Replace the 1KA/1KF boards.*
  - ⇒ *Replace the harness between the 1KA and 1KF boards.*
  - ⇒ *Check for noise malfunction and shield integrity.*
- 

**ERROR CODE P2052** [LSEQ] Program includes unavailable instructions.

An unavailable instruction is included in basic operation part of the KLogic program (lsqpg).

Example: JMOVE.

- ⇒ *Delete unavailable instruction from the KLogic program (lsqpg).*
- 

**ERROR CODE P2053** [LSEQ] Too many steps exist.

An excessive number of steps exist in the basic operation part of the KLogic program (lsqpg).

- ⇒ *Correct the KLogic program so the number of steps does not exceed the maximum number of steps allowed (10,000 steps maximum).*
- 

**ERROR CODE P2054** [LSEQ] Invalid type of signal variable.

An instruction that specifies an invalid signal variable as an argument is used in the basic operation part of the KLogic program.

Example: LSQ OUT,&X0000.

- ⇒ *Ensure a valid signal variable is used in the KLogic program.*  
Example: LSQ OUT,&Y0000.
-

---

## TROUBLESHOOTING

**ERROR CODE P2055** [LSEQ] Program is already running.

During execution of the basic operation part of the sequence function of the KLogic program, the program is executed again by the LSQEXECUTE command/instruction.

- ⇒ *Place the basic operation part of the sequence function in HOLD and re-execute.*
  - ⇒ *Correct the currently running program using the LSQREWRITE command.*
- 

**ERROR CODE P2056** [LSEQ] No. of signal is outside specifiable range.

The basic operation part of the KLogic program includes an instruction that specifies an invalid signal number as an argument.

Example: LSQ STR, &X0800.

- ⇒ *Ensure valid signal numbers are used in the KLogic program.*
  - Example: LSQ STR,&X07FF.
- 

**ERROR CODE P2057** [SerialFlash] cannot open file.

A file stored on the 1KA board cannot be opened.

Main cases include:

1. The file is corrupt.
2. An attempt to save is made, but the 1KA board serial flash memory is set to write-protect.

- ⇒ *Ensure the 1KA board serial flash memory is not set to write-protect.*
  - ⇒ *Replace the 1KA board serial flash memory.*
- 

**ERROR CODE P2058** [SerialFlash] data read error.

A file on the 1KA board cannot be read because the file is corrupt.

- ⇒ *Replace the 1KA board serial flash memory.*
-

---

## TROUBLESHOOTING

**ERROR CODE P2059** [SerialFlash] data write error.

The specified file cannot be written to the 1KA board.

Main causes include:

1. The file is corrupt.
2. The serial flash memory on the 1KA board is set to write-protect.

⇒ *Ensure the 1KA board serial flash memory is not set to write-protect.*

⇒ *Replace the 1KA board serial flash memory.*

---

**ERROR CODE P2060** [SerialFlash] File or directory doesn't exist.

The specified file or directory does not exist in the serial flash memory on the 1KA board.

⇒ *Ensure the file or directory exists in the serial flash memory.*

⇒ *Create a new file or directory.*

---

**ERROR CODE P2061** File does not exist in floppy.

When accessing the floppy disk, the specified file cannot be found on the floppy disk.

⇒ *Ensure an existing file name is specified.*

---

**ERROR CODE P2062** [FDD/PC\_CARD] Failure in writing data per verify function.

When the verify function is enabled in AUX 0208, the destination and source data are compared when writing data to a floppy disk or PC card. This error occurs if the data does not match.

⇒ *Replace the floppy disk/PC card.*

⇒ *If this error recurs, replace the 1KA/1KF boards or harness.*

---

**ERROR CODE P2063** [FDD/PC\_CARD] Faulty response from verify function.

Setting enable or disable for the verify function in AUX 0208 failed.

⇒ *Re-execute.*

⇒ *If this error recurs, replace the 1KF board.*

---

## TROUBLESHOOTING

**ERROR CODE P2064** [FDD] No space available.

Floppy disk has less than 12 KB of free space and the data cannot be saved.

- ⇒ *Insert a floppy disk with sufficient free space and re-execute.*
  - ⇒ *Delete unnecessary data from the floppy disk and re-execute.*
- 

**ERROR CODE P2065** [Multi Disks] Invalid disk was loaded.

When loading data that is saved to several floppy disks, the data on the currently inserted floppy disk does not follow the data previously loaded.

- ⇒ *Use a PC to verify data on disk.*
  - ⇒ *Ensure data is loaded in the order it is saved.*
- 

**ERROR CODE P2066** Boot flash state is write-disenable.

Attempting to rewrite the contents of the boot flash memory.  
Example: Rewriting the MAC address.

- ⇒ *Boot flash memory is write-protected.*
- 

**ERROR CODE P2067** [Serial Flash] File directory error.

Specified directory exists, but cannot be read due to abnormality.  
Example: Error when accessing the serial flash memory.

- ⇒ *Replace the serial flash memory on the 1KA board.*
- 

**ERROR CODE P2068** Cannot execute program being edited now.

An attempt is made, from another monitor, to edit the file currently being edited, or to CALL the program from another program.

- ⇒ *Complete the program edit and re-execute.*
-

---

## TROUBLESHOOTING

**ERROR CODE P2069** [FDD/PC\_CARD] Device already in use.

Attempting to perform several processes at the same time to/from the floppy disk/PC card. The next task is commanded while the previously commanded task is in progress.

⇒ *Allow each task to be completed before initiating another task to/from the floppy disk/PC card.*

---

**ERROR CODE P2070** No more data can be registered.

An attempt is made to set additional signal names or comments beyond the maximum number allowed in the KLogic program.

⇒ *Delete unnecessary signal names and comments.*  
⇒ *Initialize all data.*

---

**ERROR CODE P2071** C/S switch set to disable.

The CYCLE START switch is pressed while the cycle start switch invalid option set ON.

⇒ *Set the cycle start switch invalid option OFF and re-execute.*

---

**ERROR CODE P2072** [LSEQ] Maximum cycles of execution.

While executing the basic operation part of the KLogic program, execution cycle time is calculated as longer than the cycle time set using the LSQ\_CYCMAX (maximum length of execution cycle) command/instruction. In this case, the program is not executed.

⇒ *Reduce the number of steps in the program.*  
⇒ *Increase the maximum execution cycle time (if possible).*

---

**ERROR CODE P2073** [LSEQ] Other program is waiting execution.

During execution of the basic operation part of the KLogic program, an attempt is made to execute LSQREWRITE. Overwriting program data using the LSQREWRITE command/instruction is executed after completing the last step of the currently running program.

⇒ *Allow the current program execution to complete before executing the LSQREWRITE command/instruction.*

---

---

## TROUBLESHOOTING

**ERROR CODE P2074** Floppy disk is broken.

This error occurs when ten or more defective sectors are detected on a floppy disk.

⇒ *Use a new or known good floppy disk.*

---

**ERROR CODE P2075** Channel number of JtXX is incorrect.

Main causes include:

1. Non-existing channel number is allocated.
2. Board for driving Mitsubishi motor is not installed or incorrect board is installed on the 1KB board.

⇒ *Ensure the external axis channel number set in AUX 2002 is correct.*

⇒ *Ensure the correct Mitsubishi motor driving board is installed to the 1KB board.*

---

**ERROR CODE P4500** FIELD-BUS) Interface not enabled.

Main causes include:

1. An attempt is made to execute the PROFIBUS (/DEVNET) command without registering the appropriate fieldbus interface.
2. The PROFIBUS (/DEVNET) interface card is not installed.

⇒ *Ensure the fieldbus interface is registered.*

⇒ *Ensure the fieldbus interface card is properly installed.*

---

**ERROR CODE P4501** DEVNET) Node XX not in the scanlist.

An attempt is made to execute the DEVNET command to a slave that is not in the scanlist.

⇒ *Ensure the MAC\_ID, settings and parameters for the device to receive the monitor command are correct and re-execute the DEVNET command.*

---

---

## TROUBLESHOOTING

**ERROR CODE P4502**      DEVNET) Already in that mode.

An attempt is made to change the operation mode setting, using the DEVNET command, to the mode that is currently set.

⇒ *Ensure the correct parameter is set and re-execute the DEVNET command.*

---

**ERROR CODE P4503**      Duplicate signal number.

The specified signal number cannot be used because the same signal number is currently set.

⇒ *Specify a different signal number.*

---

**ERROR CODE P5000**      Waiting weld completion.

Displayed when a command to change the step is entered while a welding sequence is in progress (weld complete or retract/extend signal not received).

⇒ *Reset the error, and release the wait condition.*

⇒ *Manually input weld complete or retract/extend signal.*

---

**ERROR CODE P5001**      Waiting retract or extend pos. input signal.

One of the following operations is attempted when the robot is processing a spot weld sequence (waiting for the Retract/Extend signal after the weld complete signal is received).

1. Cycle start (including EXECUTE, CONTINUE command).
2. Program selection or step change.
3. Record.

⇒ *Input the Retract/Extend detection signal to the robot or access the wait override screen on the teach pendant. Refer to the D Series Controller Operations and Programming Manual for the wait override procedure.*

---

---

## TROUBLESHOOTING

**ERROR CODE P5002** Spot sequence is running.

Step change, program change, or program execution attempted while the spot weld sequence is executing (after Retract/Extend input signal and weld complete signal are received).

Example: The robot is executing motion start delay time after weld complete.

⇒ *Perform step change, program registration or program execution after the spot welding sequence is complete.*

⇒ *Reset the error, and release the wait condition.*

---

**ERROR CODE P5003** External axis type and gun data mismatch.

The servo gun setting does not correspond to the type of external axis (set in AUX 2002) and type of gun (set in AUX 0605-12). This error is detected when motion begins for a step with a clamp signal set.

⇒ *Confirm that the external axis and gun type data settings are correct.*

---

**ERROR CODE P6000** Shifted location of STEP XX is out of range.

After the shift function is executed, an axis (axes) exceeds motion range.

⇒ *Ensure the new pose data after the shift is within motion range.*

---

**ERROR CODE P6001** Step XX in source program is out of motion range.

Source program pose data is out of motion range in the shift function.

⇒ *Ensure the pose data in the source program is within motion range.*

---

**ERROR CODE P6003** Cannot execute program because of suspend playback.

An attempt is made to cycle start when the dedicated input signal for forced termination of repeat operation is set OFF.

⇒ *Manually input the dedicated signal for forced termination of repeat operation.*

---



---

## TROUBLESHOOTING

**ERROR CODE P6500** Cannot generate working line direction.

This error occurs when weld start and end points are the same, and motion direction cannot be determined.

⇒ *Ensure the start and end points are not the same.*

---

**ERROR CODE P6501** Illegal tool posture.

The tool angle (angle between torch and welding line; also called torch angle) is 0 degrees and the welding cannot be executed.

⇒ *Teach a third point besides the weld start and end points above the line between the start and end points so that the torch assumes an appropriate angle.*

---

**ERROR CODE P6502** No weld database.

The arc weld condition database specified by the source program does not exist.

⇒ *Create arc weld condition database specified by the program.*

---

**ERROR CODE P6503** Cannot change weld condition.

An attempt is made to change weld conditions using the real time weld condition modification function without selecting check mode and WELD ON.

⇒ *To change weld conditions using the real time weld condition modification function.*

1. *Select check mode.*
  2. *Set WELD ON.*
  3. *Change weld conditions.*
- 

**ERROR CODE P6504** Step:XX Preceding L.START missing.

This error occurs when an L.START instruction does not proceed an L.END instruction.

⇒ *Add a step containing an L.START instruction before the step containing the L.END instruction.*

---

## TROUBLESHOOTING

**ERROR CODE P7000**      Cannot program reset, because not at home position 1.

The robot is not at the registered home 1 position, and the program reset signal is ignored.

⇒ *Ensure the robot is at the home 1 position, and re-execute.*

---

## TROUBLESHOOTING

### 1.3.2.4 WXXXX MECHANICAL/CONTROL WARNING ERROR CODES

**ERROR CODE W1000** Cannot move along straight line JTXX in this configuration.

When operating manually in teach mode and in base or tool mode, axis (JTXX) speed exceeds capability with the wrist in this posture.

- ⇒ *Change the wrist posture.*
  - ⇒ *Reduce teach speed.*
  - ⇒ *Reduce repeat speed.*
  - ⇒ *Change the interpolation mode to joint.*
- 

**ERROR CODE W1001** Over maximum joint speed in check. Set low speed.

Commanded speed for each joint exceeds the allowable value during check operation.

- ⇒ *Reduce check speed, re-execute.*
- 

**ERROR CODE W1002** Operation information was cleared.

The memory area used to store operational information is corrupt.

- ⇒ *Cycle the controller power OFF and ON.*
  - ⇒ *If this error recurs, replace the 1KA board.*
- 

**ERROR CODE W1003** Calibration failed. Retry after changing posture.

Auto load measurement failed.

- ⇒ *Change the posture of the robot to allow sufficient torque load to be applied to JT3, 5, and 6 for auto load measurement.*
- 

**ERROR CODE W1004** JTXX out of motion range. Check operational area.

The robot motion exceeds the operational area set during auto load measurement.

- ⇒ *Increase the range of motion set for auto load measurement.*
  - ⇒ *Ensure the robot posture is configured as described in the auto load measurement procedure.*
-

---

## TROUBLESHOOTING

**ERROR CODE W1005** Illegal center of gravity, default parameter is set.

Load mass value is set to a value other than zero, but the center of gravity is set to all zeroes.

⇒ *Enter the correct center of gravity value.*

---

**ERROR CODE W1006** Incorrect load moment. Default parameter is set.

Load mass value and center of gravity are set, but the load moment of inertia is set to all zeroes.

⇒ *Set correct values for the load moment of inertia.*

---

**ERROR CODE W1007** Application setting changed. Turn OFF & ON the control power.

When application setting is changed, controller power must be cycled OFF and ON.

⇒ *Cycle controller power OFF and ON.*

---

**ERROR CODE W1008** Parameter changed. Turn OFF & ON the control power.

When parameters are changed, controller power must be cycled OFF and ON.

⇒ *Cycle controller power OFF and ON.*

---

**ERROR CODE W1009** Position envelope error of jtXX at last E-stop.

The error message is generated when an E-stop is applied and the position of the robot is not within a range of the commanded position. The error deviation range is specified in AUX 0503.

⇒ *Before the error is reset, the operator must be aware of the robot's position within the work envelope.*

---

---

## TROUBLESHOOTING

**ERROR CODE W1010**      RAM battery low voltage.

Main causes include:

1. Backup battery voltage below minimum value (3.3 VDC or less).
2. Defective battery harness.
3. Defective 1KA board.

⇒ *Back up system and program data. Check and replace batteries as required.*

⇒ *Check batteries for defective connections. Repair as required.*

⇒ *Defective battery voltage monitoring circuit. Replace the 1KA board.*

---

**ERROR CODE W1011**      PLC alarm. (XX)

This error occurs when a PC3JB (TOYOPUC) internal error (alarm) is present (battery voltage low error, etc.).

⇒ *Refer to the PC3JB (TOYOPUC) manual for the alarm code (XX).*

⇒ *Replace the PC3JB (TOYOPUC).*

---

**ERROR CODE W1012**      Servo parameter Changed. Turn OFF & ON the control power.

When robot model, number of axes, servo parameters for external axes, or the 1KB board are changed, controller power must be cycled OFF and ON.

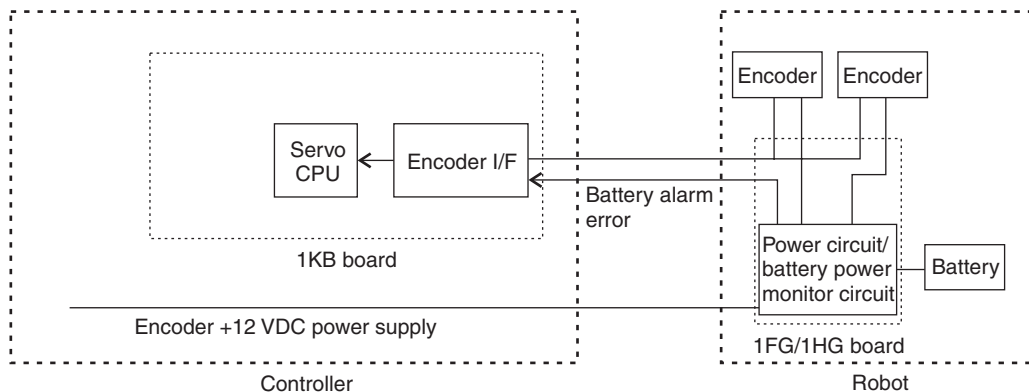
⇒ *When model is changed, the servo software must also be changed.*

⇒ *Cycle controller power OFF and ON.*

---

**TROUBLESHOOTING****ERROR CODE W1013** Encoder battery low voltage [Servo (XX)].

Voltage of the encoder back up battery on the 1FG/1HG board decreased to 3.3 volts or less, or the encoder battery alarm signal (BAL\_AL) is disconnected. This error is only detected at control power on or motor power on.



Main causes include:

1. Discharged batteries.
2. Defective encoder battery board (1FG/1HG board).
3. Defective encoder.
4. Short in the harness from the encoder battery backup board to the encoder.
5. Short in the harness or defective encoder causing increased battery discharge.
6. Battery alarm signal line from the 1FG/1HG board is disconnected.
7. Defective servo board (1KB board).

⇒ *Replace the battery. There is a possibility that internal encoder data may be lost. Check the robot zeroing.*

⇒ *Check each harness for short circuit.*

⇒ *Replace the encoder, the 1KB servo board, or the 1FG/1HG encoder battery backup board, if necessary.*

**ERROR CODE W1014** Number of Axis Changed. Reinitialize.

The number of axis assigned to the robot has changed.

⇒ *Change the number of axes and initialize the system.*

---

## TROUBLESHOOTING

**ERROR CODE W1015** Possibility of failure.

The monitored value of  $I^2$  (current squared) exceeds the normal value for the monitored program and indicates excessive wear in the cyclo reduction unit or a servo motor/brake problem.

Current increase may be caused by program modifications.

- ⇒ *If the robot control program is modified, the monitored value of  $I^2$  may need to be re-evaluated and changed.*
  - ⇒ *Check and replace the worn cyclo reduction unit.*
  - ⇒ *Check and replace the defective servo motor/brake assembly.*
- 

**ERROR CODE W1016** Torque of motor is over limit. JTXX

This error occurs when the current value exceeds the permitted set value. This error may also occur if the overspeed load torque or inertia force is too high.

- ⇒ *Ensure the robot program moves do not cause excessive load torque or inertia force.*
  - ⇒ *Reduce the robot program speed or accel/decel parameters.*
  - ⇒ *Ensure the load on the robot arm does not exceed the robot's capacity.*
- 

**ERROR CODE W1017** Encoder battery low voltage. [External axis (XX)]

Main causes include:

1. Discharged batteries.
2. Defective encoder battery board (1FG/1HG board).
3. Defective encoder.
4. Short in the harness from the encoder battery backup board to the encoder.
5. Battery discharge.
6. Defective servo board (1KB board).

- ⇒ *Exchange the battery. There is a possibility that internal encoder data may be lost. Check the robot zeroing.*
  - ⇒ *Check each harness for short circuit.*
  - ⇒ *Replace the encoder, the 1KB servo board, or the 1FG/1HG encoder battery backup board, if necessary.*
-

---

## TROUBLESHOOTING

**ERROR CODE W1018** Network parameter is changed. Turn OFF & ON the control power.

When network setting data is changed, the controller power must be cycled OFF and ON.

⇒ *Cycle controller power OFF and ON.*

---

**ERROR CODE W1019** The registered value is beyond rated load.

The moment of inertia of the tool exceeds the permitted value when the auto load measurement is executed.

⇒ *Ensure the tool and payload do not exceed the capacity of the robot.*

⇒ *Re-execute the auto load measurement.*

---

**ERROR CODE W1020** Error sector was found.

This error occurs when a defective sector is detected on a floppy disk.

⇒ *The disk may be used, but it is recommend to transfer the data to a new floppy disk.*

---

**ERROR CODE W1021** The optimal posture can't be found at present location.

When optimal configuration mode is selected, position and optimal tool posture, for changing to linear motion, is not obtained in the current position and tool posture.

⇒ *Select a different mode.*

⇒ *Change the robot position and tool posture and re-execute.*

---

**ERROR CODE W4500** FIELD-BUS) Slave port OFFLINE.

Slave port is offline due to master power or communication line termination.

⇒ *Check the master power and communication line and repair as necessary.*

*When repairs are completed wait for on-line status to return (1JF board LED 1 ON).*

---



---

## TROUBLESHOOTING

**ERROR CODE W4501** FIELD-BUS) Master port OFFLINE.

Master port is offline due to communication line termination.

⇒ *Check the slave and communication line and repair as necessary.*  
When repairs are completed wait for on-line status to return (1JF board LED 1 ON).

---

**ERROR CODE W5001** PLC communication error.

During PLC communication through the remote I/O function, an error occurred.

Main causes include:

1. The PLC is not in run mode.
2. After the NAC (communication processor) is initialized the INIT\_COMPLETE BIT is not set ON.

⇒ *Ensure the PLC is in run mode.*  
⇒ *Ensure the NAC configuration is correct.*  
⇒ *Ensure the PLC connection is established.*  
⇒ *Check for noise malfunction and shield integrity.*

---

**ERROR CODE W5002** Weld controller XX not connected.

During execution of the connection check sequence to the weld controller no response is returned from the weld controller.

⇒ *Ensure the welder connection is established. Repair or replace weld controller and interface cable as necessary.*  
⇒ *Ensure the welder is operational.*  
⇒ *Check for noise malfunction and shield integrity.*

---

**ERROR CODE W5003** Weld controller XX no response.

During communication with the weld controller, no response is returned.

⇒ *Ensure the welder connection is established. Repair or replace weld controller and interface cable as necessary.*  
⇒ *Ensure the welder is operational.*  
⇒ *Check for noise malfunction and shield integrity.*

---

---

## TROUBLESHOOTING

**ERROR CODE W5004** Weld controller XX response error.

During communication with the weld controller, data received from the weld controller does not conform to the specified protocol.

- ⇒ *Ensure the welder connection is established. Repair or replace weld controller and interface cable as necessary.*
  - ⇒ *Ensure the welder is operational.*
  - ⇒ *Check for noise malfunction and shield integrity.*
- 

**ERROR CODE W5005** (Spot welding) No response from RWC XX.

This error occurs when the robot controller sends weld conditions to the remote weld controller (RWC), and does not receive a response (XX indicates the weld controller number).

- ⇒ *Defective welder or welder communication cables.*
  - ⇒ *Defective 1KA/1GS board.*
  - ⇒ *Check for noise malfunction and shield integrity.*
- 

**ERROR CODE W5006** (Spot welding) RWC response error XX.

This error occurs after weld conditions are sent to the specified remote weld controller (RWC), and the response is abnormal (XX indicates the weld controller number).

- ⇒ *Defective welder or welder communication cables.*
  - ⇒ *Defective 1KA/1GS board.*
  - ⇒ *Check for noise malfunction and shield integrity.*
-

---

## TROUBLESHOOTING

### **ERROR CODE W5007** (Spot welding) Weld fault XX.

This error occurs when a weld complete signal is not received by the robot controller from the remote weld controller (RWC), or there is an electrical malfunction with the RWC.

Code XX:

10: Under current	11: Over current
12: Short in SCR circuit	13: SCR did not fire
14: Data error	26: No weld

Typical electrical problems include:

Fluctuation in current, faulty SCR or SCR circuit, SCR has not fired, or abnormal line voltage.

- ⇒ *Defective welder or weld gun.*
  - ⇒ *Defective 1KA/1GS board, or interface cables.*
  - ⇒ *Check for noise malfunction and shield integrity.*
- 

### **ERROR CODE W5008** (Spot welding) Cable disconnection error XX.

This error occurs when the robot controller detects a drop in current flow from the remote weld controller (RWC) to the weld gun (XX indicates the weld controller number).

- ⇒ *Defective welder or weld gun.*
  - ⇒ *Defective 1KA/1GS board, or interface cables.*
  - ⇒ *Check for noise malfunction and shield integrity.*
- 

### **ERROR CODE W5009** (Spot welding) Internal leak XX.

Weld current data from the specified remote weld controller (RWC) is abnormal. Short in secondary cable, or internal leak in secondary cable or weld gun.

- ⇒ *Defective weld cable.*
  - ⇒ *Defective weld controller or gun.*
  - ⇒ *Defective 1KA/1GS board or interface cable.*
  - ⇒ *Check for noise malfunction and shield integrity.*
-

---

## TROUBLESHOOTING

**ERROR CODE W5010** (Spot welding) Main cable exchange alarm XX.

The present value of the counter for the specified weld gun exceeds the set value for initiating an alarm to replace the main cable (XX indicates gun number).

- ⇒ *Reset the alarm counter value.*
  - ⇒ *Replace the main cable.*
  - ⇒ *Select a higher counter value.*
- 

**ERROR CODE W5011** (Spot welding) No connection with RWC XX.

The start-up sequence, for communication with the remote weld controller (RWC) during power up, failed or cannot be executed.

- ⇒ *Defective welder or welder interface cables.*
  - ⇒ *Defective 1KA/1GS board.*
- 

**ERROR CODE W5012** Cannot achieve set force.

Set force is not achieved within five seconds of pressurization start for servo spot weld gun.

Main causes include:

1. Excessive tip wear.
2. Wear measurement failure.
3. Incorrect program data in step where error occurs.
4. Clamping force value set too high.
5. Workpiece is too thin.
6. Incorrect lower limit setting (LLIMIT command).

- ⇒ *Re-execute tip wear measurement.*
  - ⇒ *Re-teach program step.*
  - ⇒ *Set appropriate clamping force value.*
  - ⇒ *Ensure workpiece is placed correctly*
  - ⇒ *Ensure lower limit setting is correct (LLIMIT command).*
-

## TROUBLESHOOTING

### 1.4 TROUBLESHOOTING FLOWCHARTS

The following flowcharts are arranged by error code number. Refer also to the corresponding error code information in section 1.3.2.2 during troubleshooting procedures.

## TROUBLESHOOTING

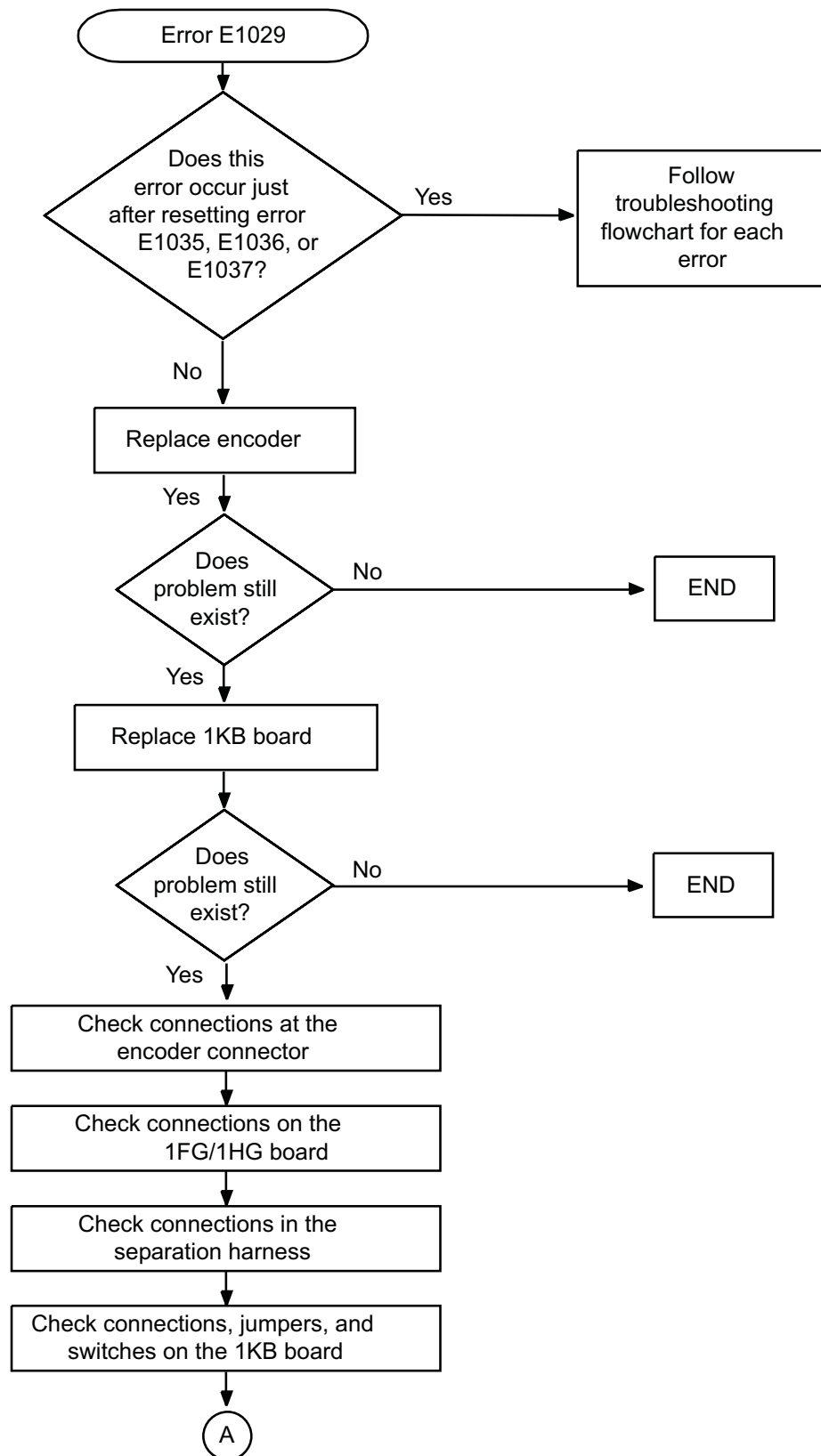


Figure 1-5 Error E1029 Flowchart (1)

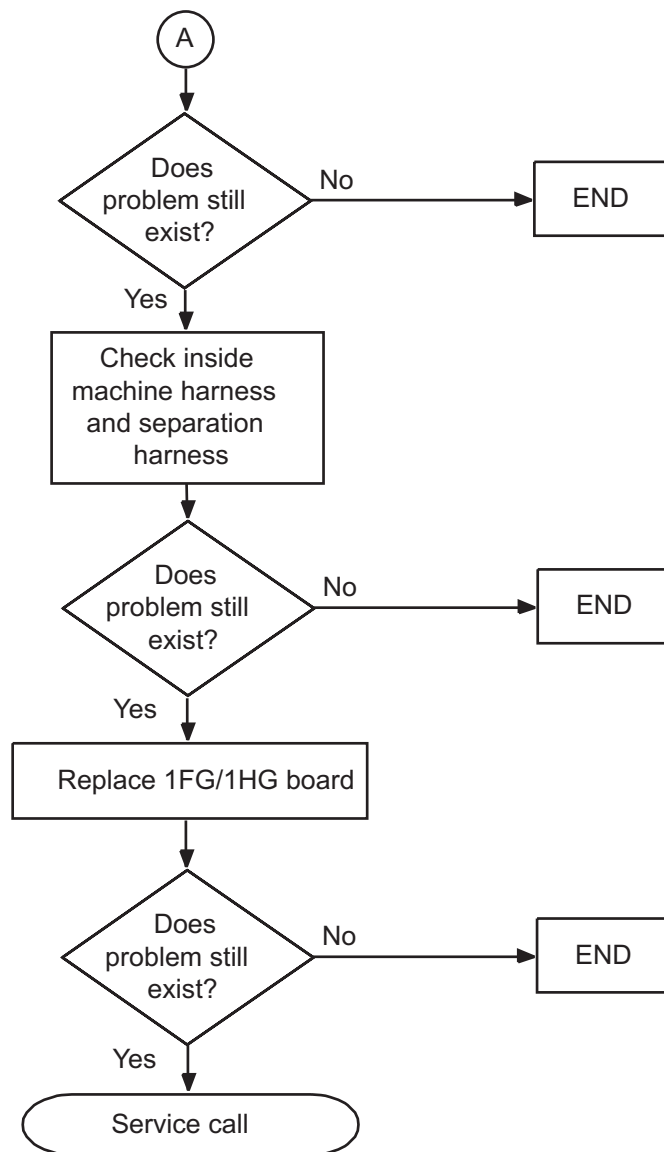
**TROUBLESHOOTING**

Figure 1-6 Error E1029 Flowchart (2)

## TROUBLESHOOTING

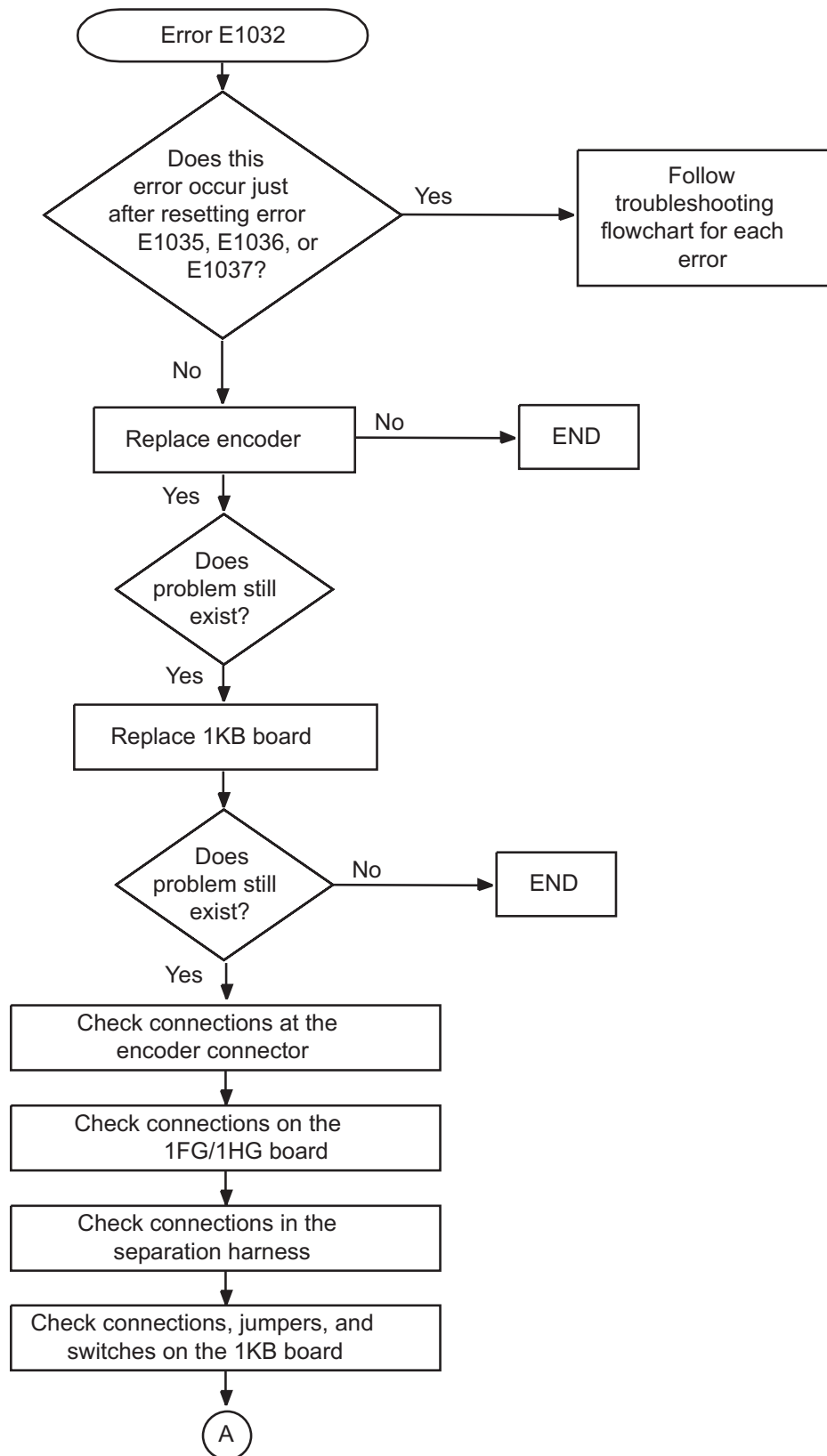


Figure 1-7 Error E1032 Flowchart (1)



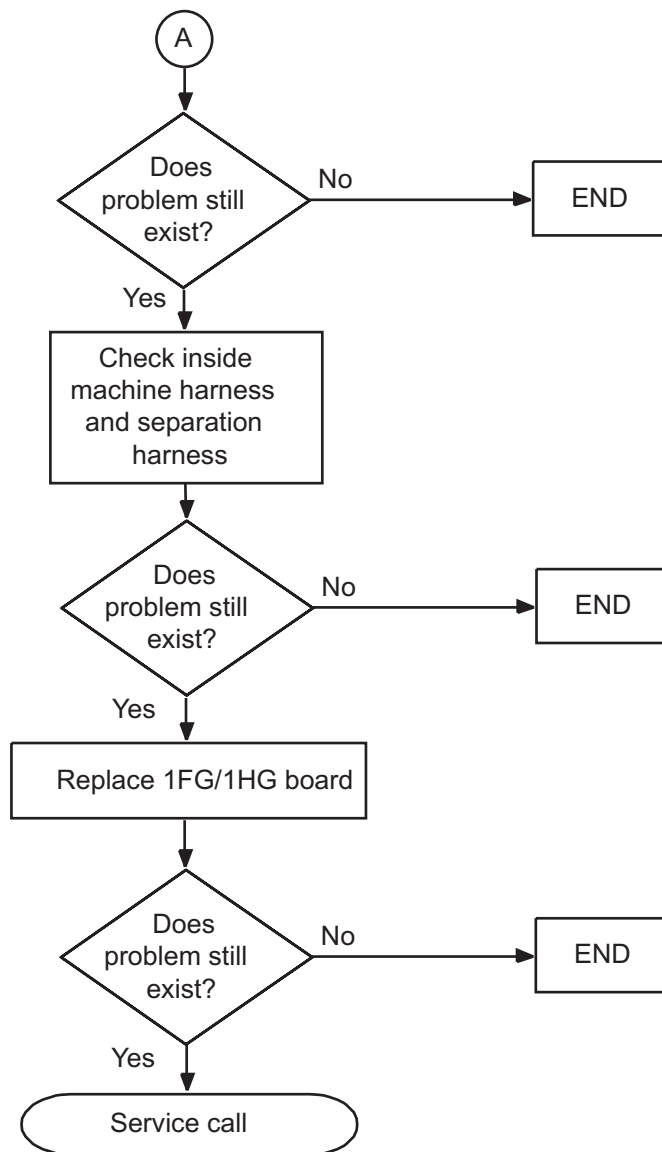
**TROUBLESHOOTING**

Figure 1-8 Error E1032 Flowchart (2)

## TROUBLESHOOTING

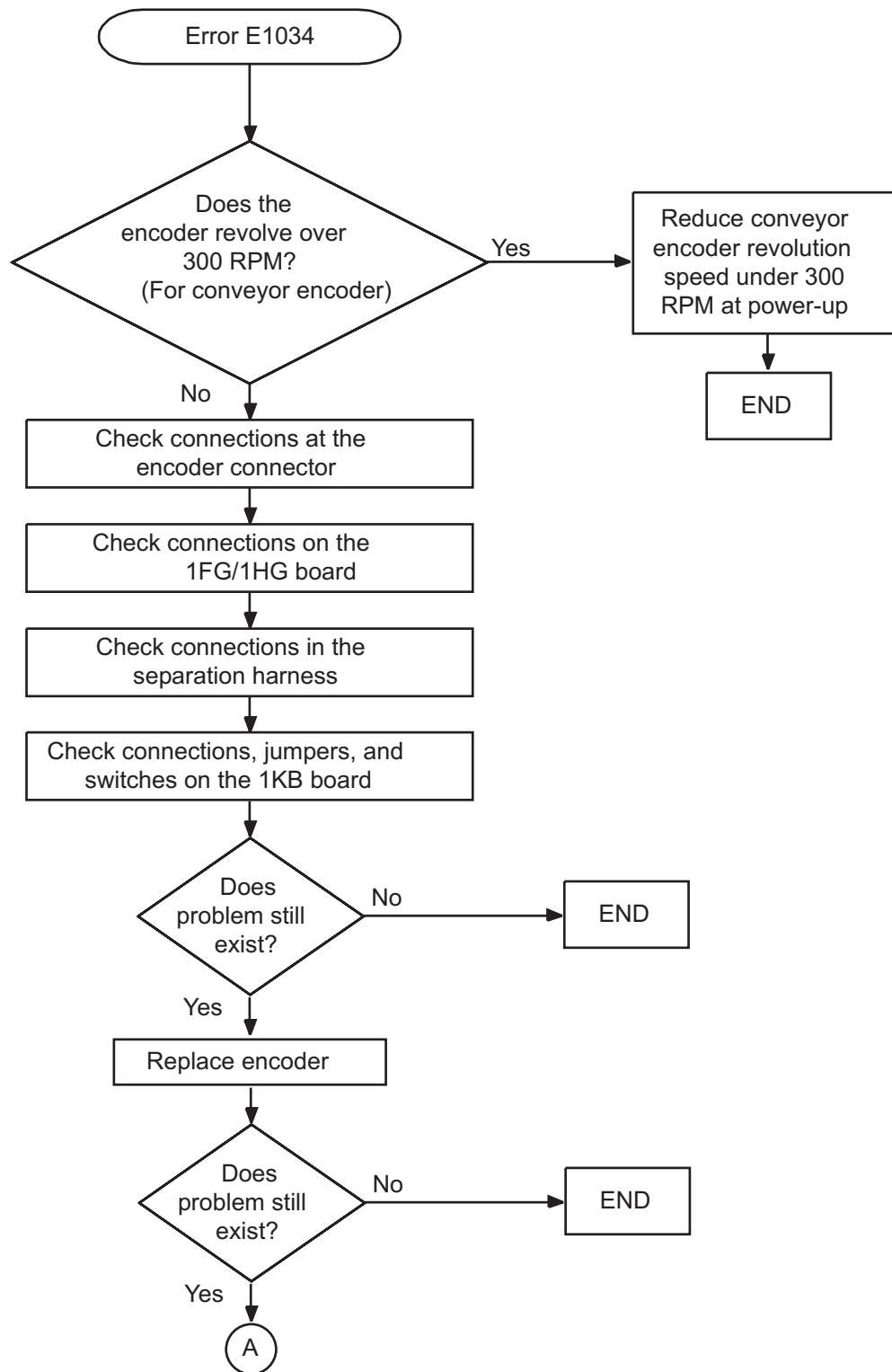


Figure 1-9 Error E1034 Flowchart (1)

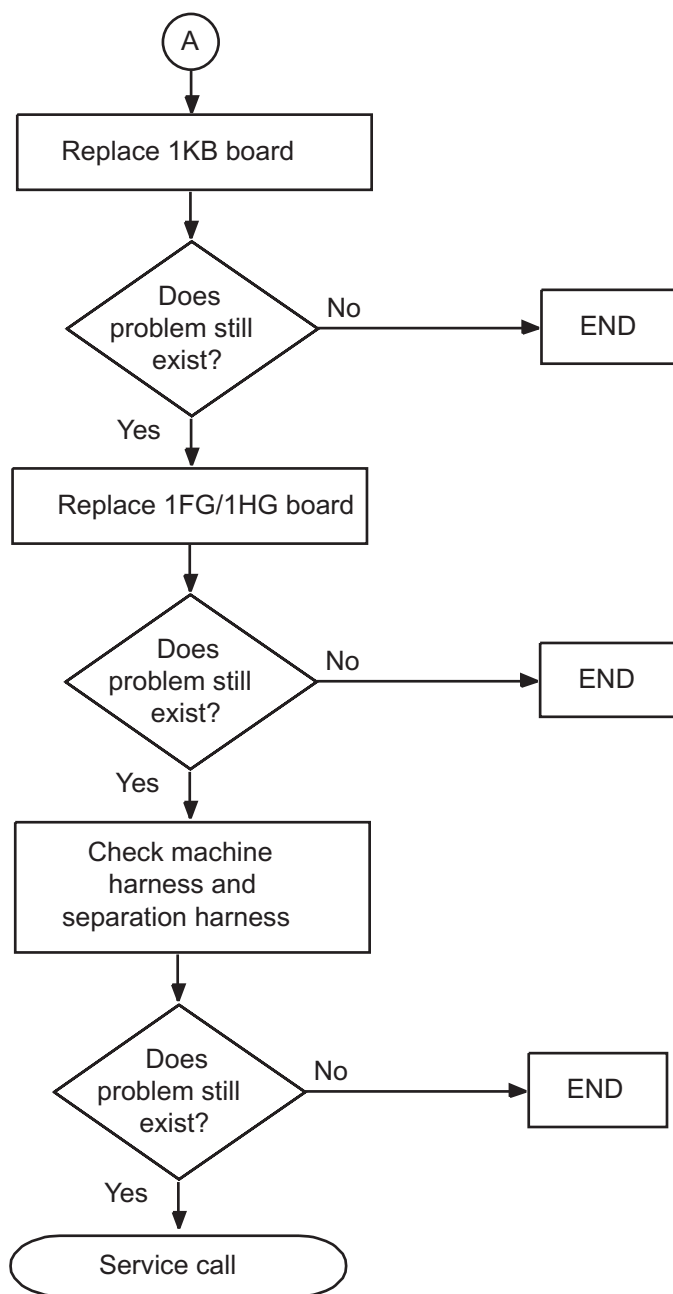
**TROUBLESHOOTING**

Figure 1-10 Error E1034 Flowchart (2)

## TROUBLESHOOTING

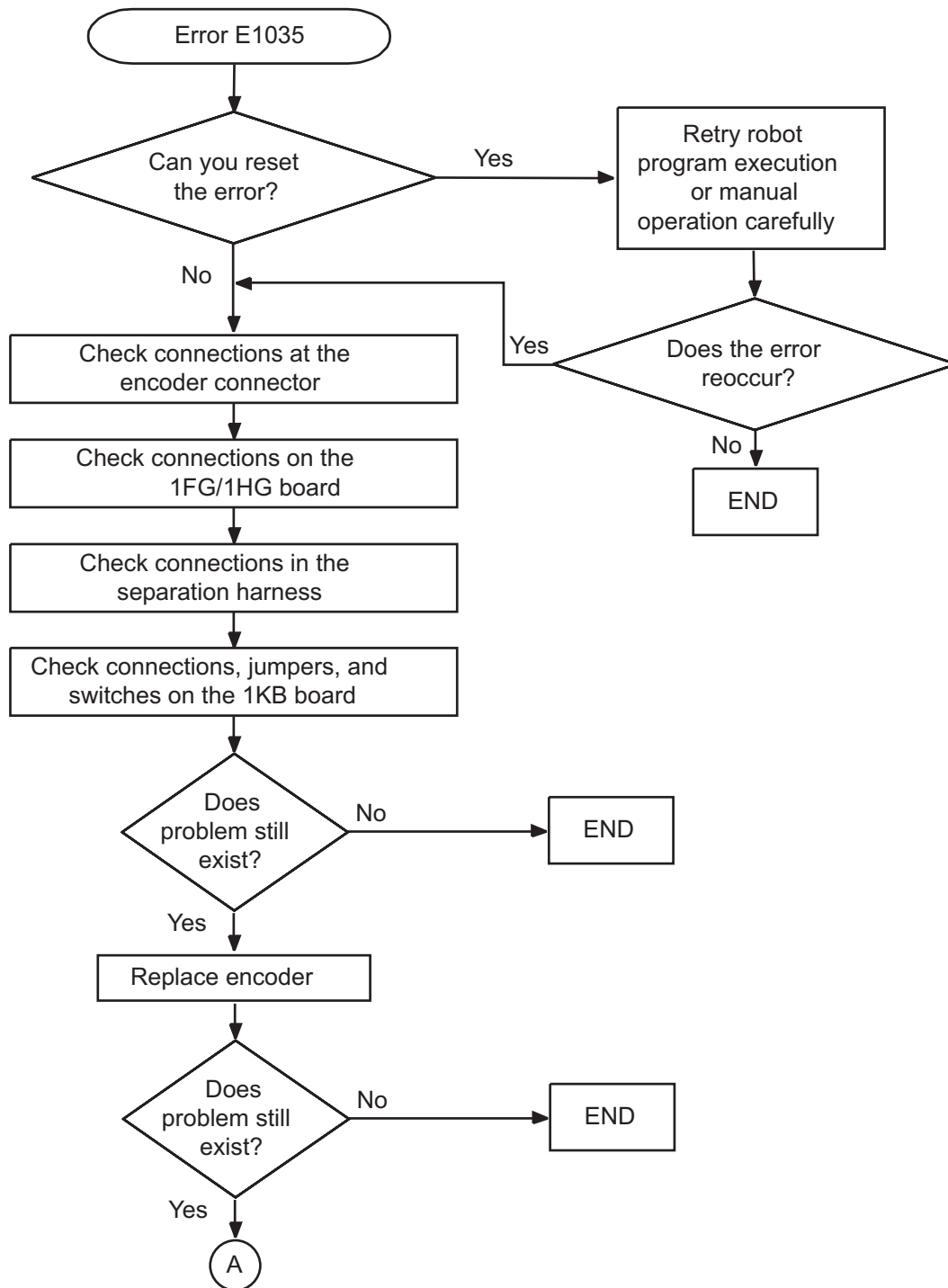


Figure 1-11 Error E1035 Flowchart (1)

## TROUBLESHOOTING

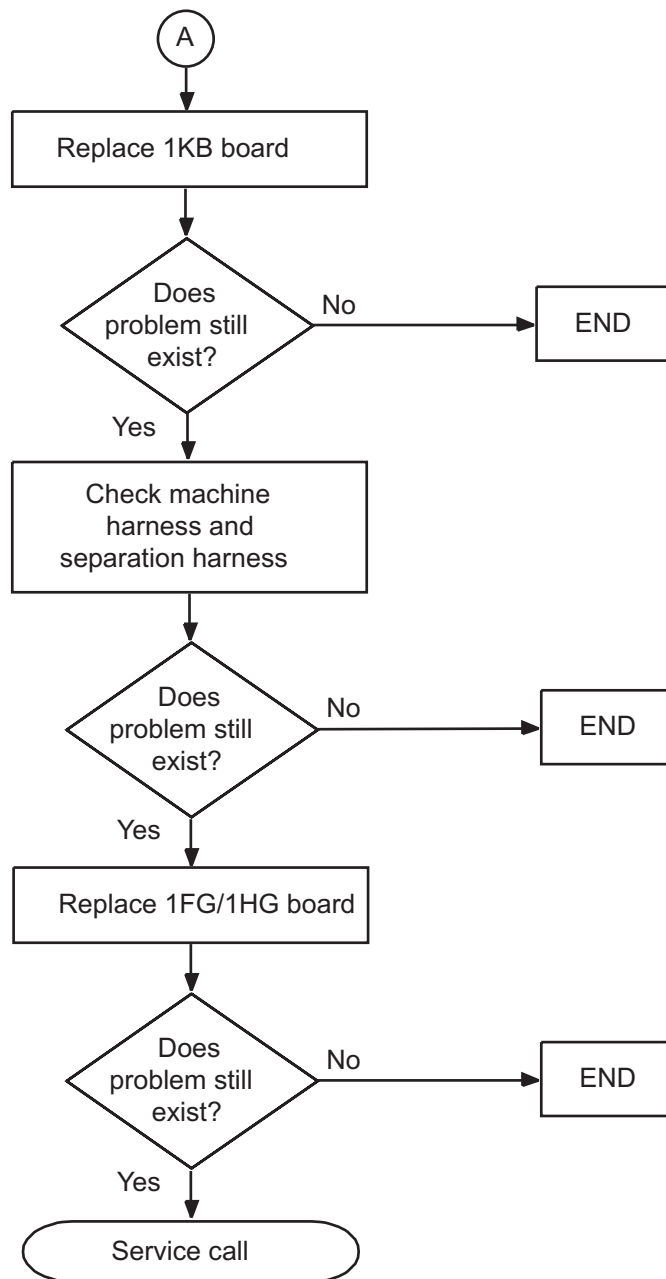


Figure 1-12 Error E1035 Flowchart (2)

## TROUBLESHOOTING

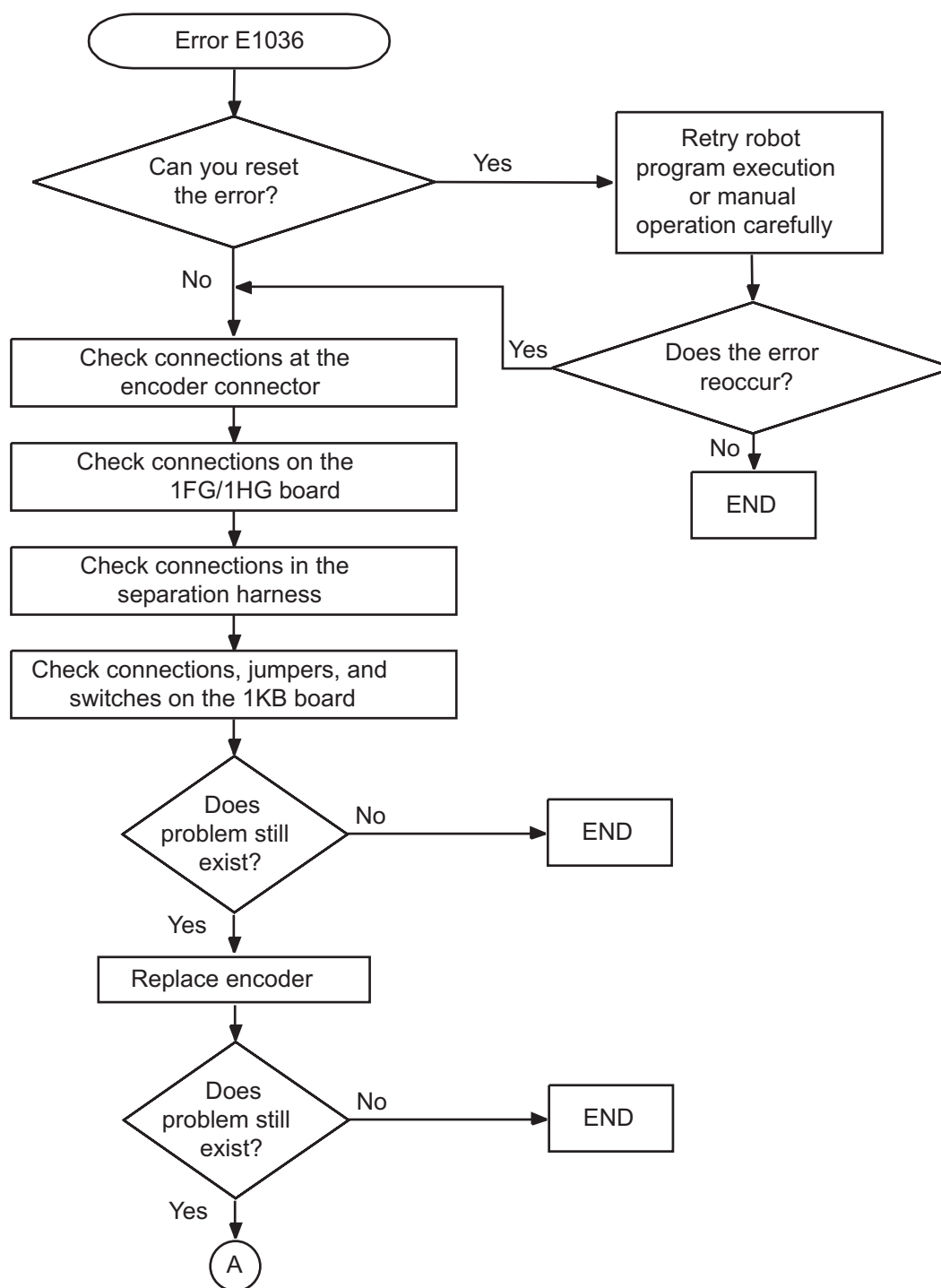


Figure 1-13 Error E1036 Flowchart (1)

## TROUBLESHOOTING

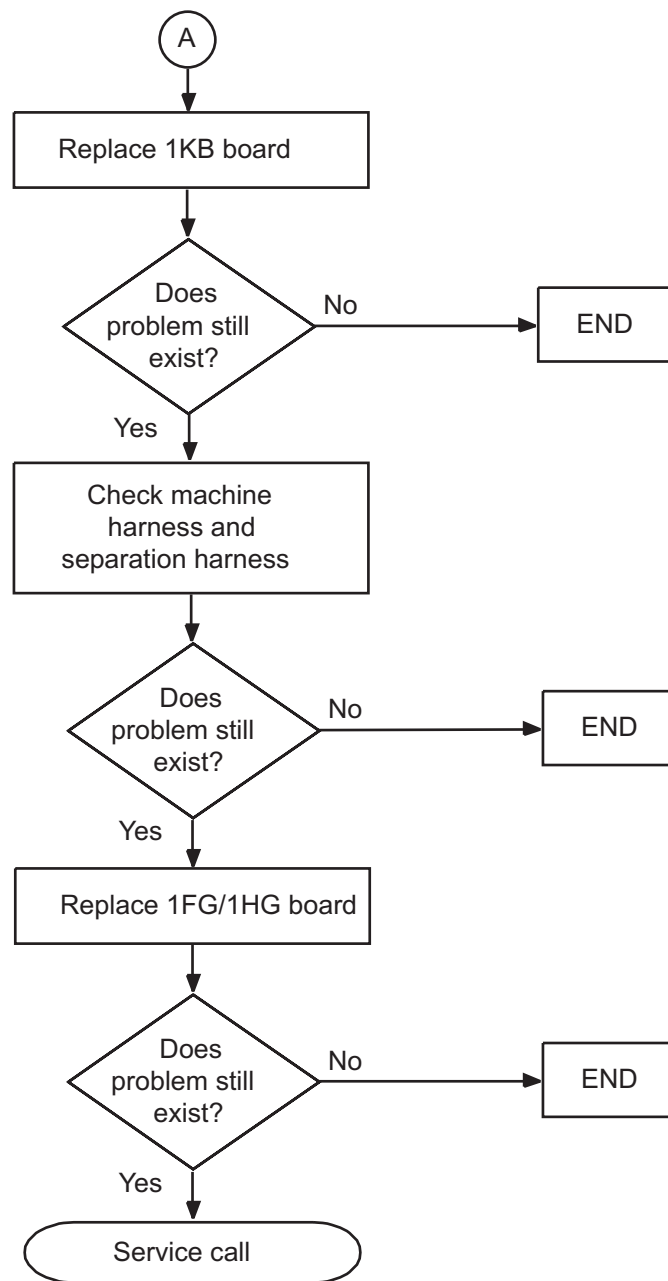


Figure 1-14 Error E1036 Flowchart (2)

## TROUBLESHOOTING

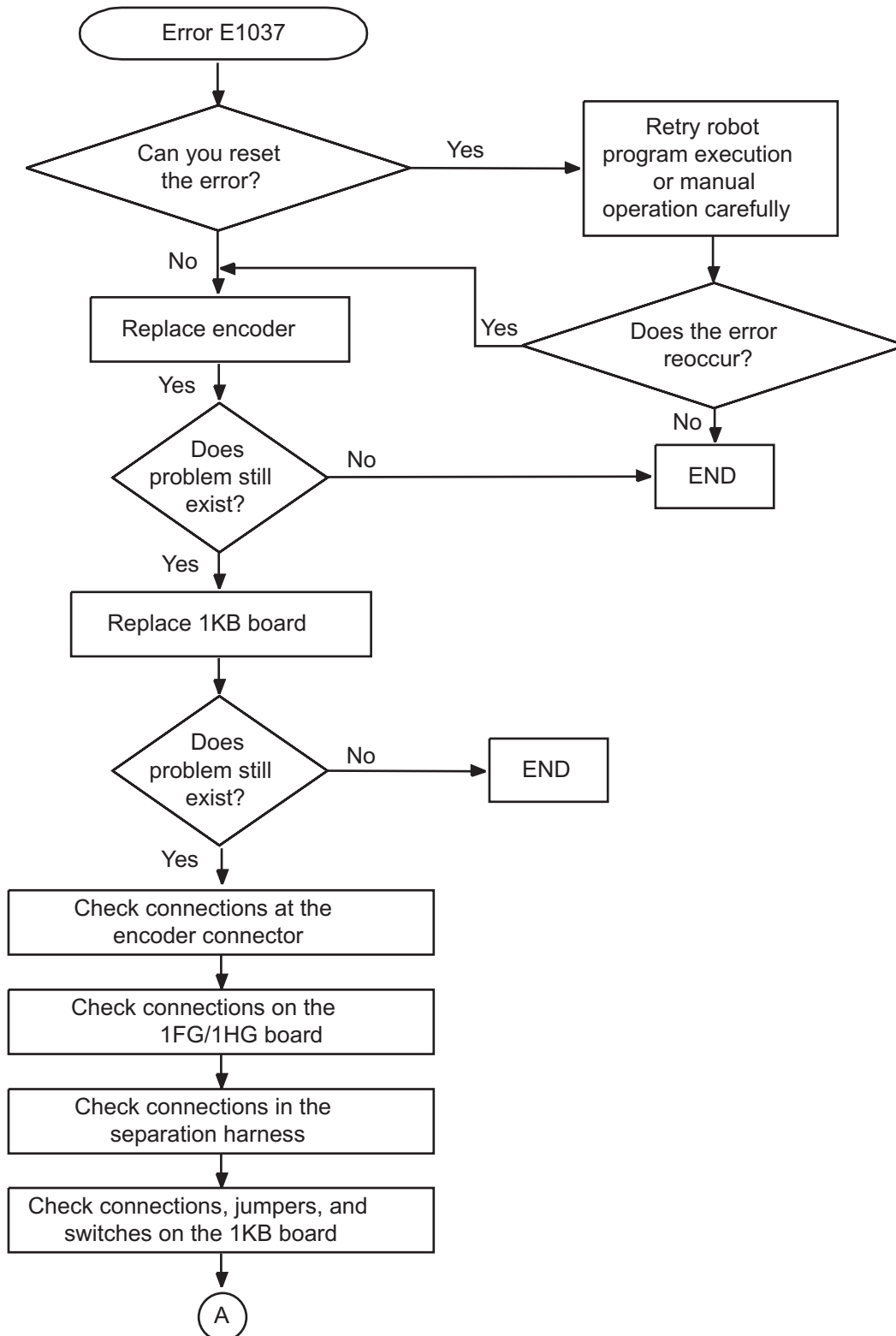


Figure 1-15 Error E1037 Flowchart (1)



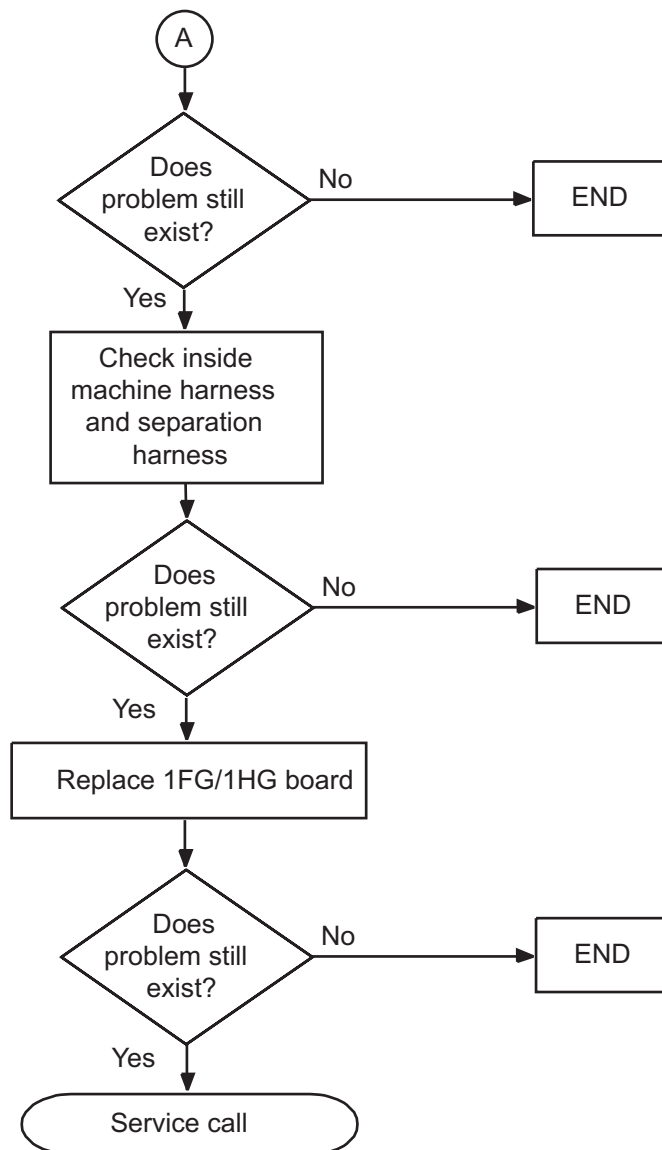
**TROUBLESHOOTING**

Figure 1-16 Error E1037 Flowchart (2)

## TROUBLESHOOTING

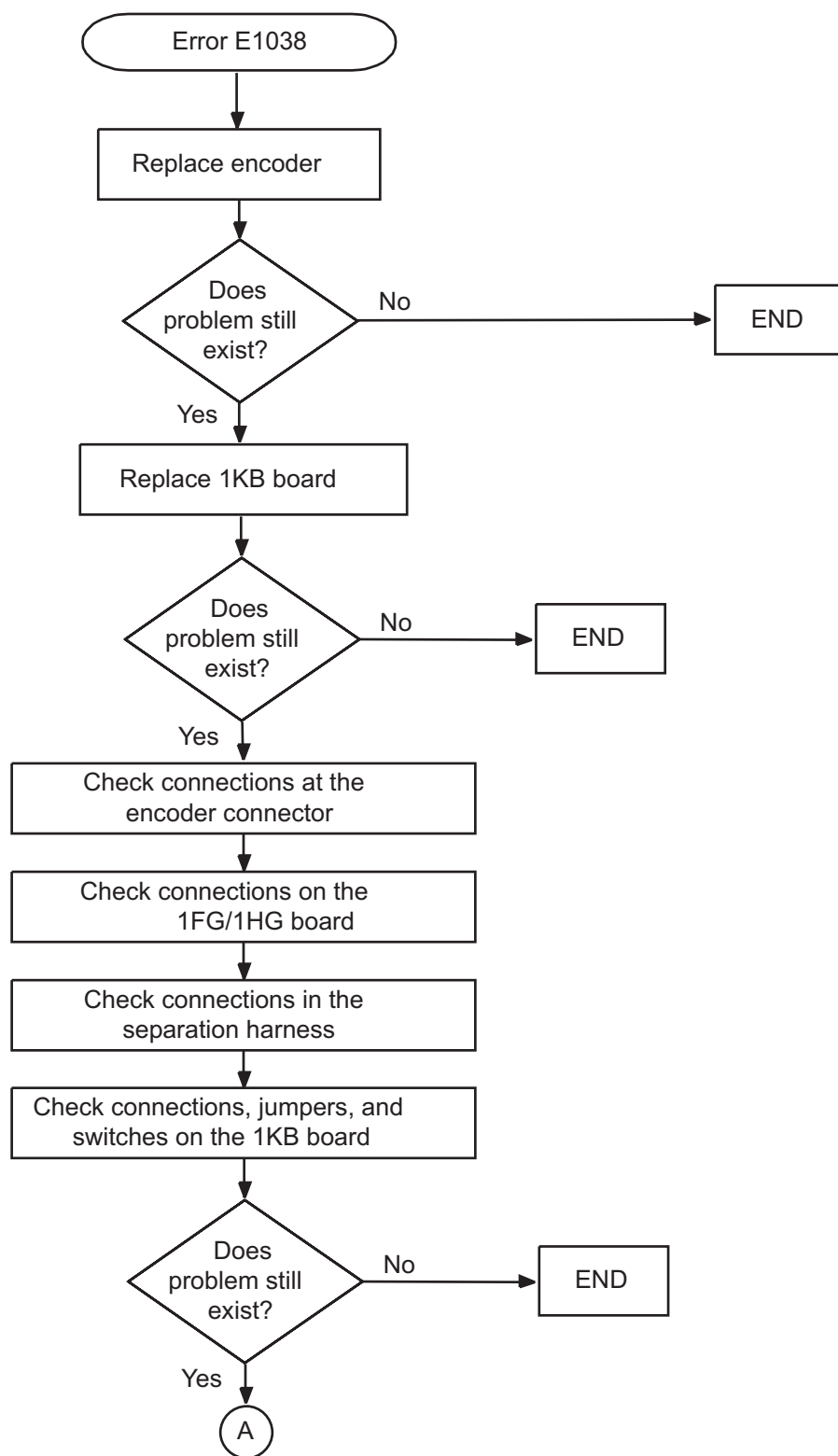


Figure 1-17 Error E1038 Flowchart (1)

## TROUBLESHOOTING

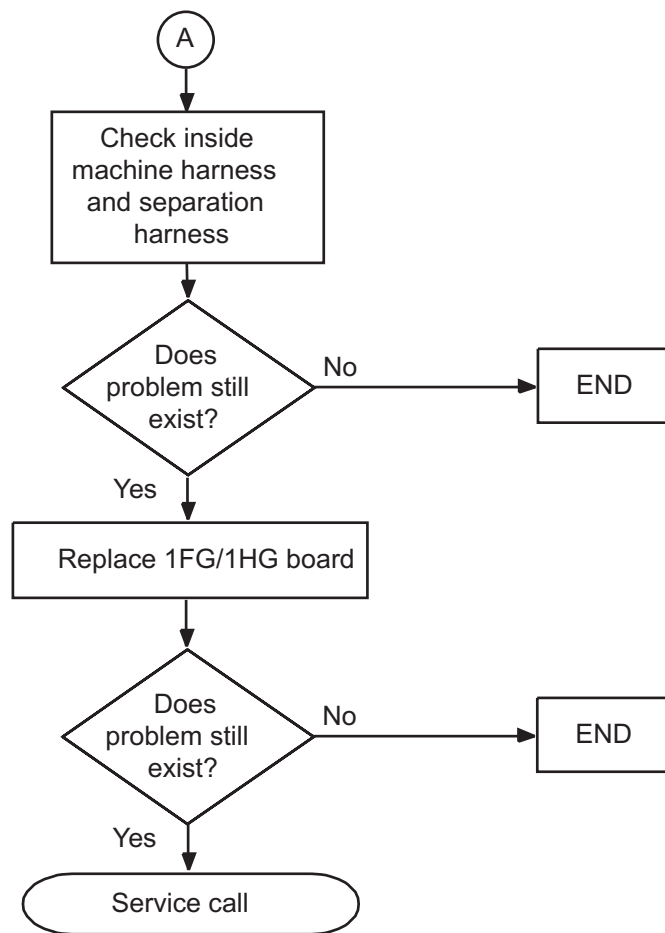


Figure 1-18 Error E1038 Flowchart (2)

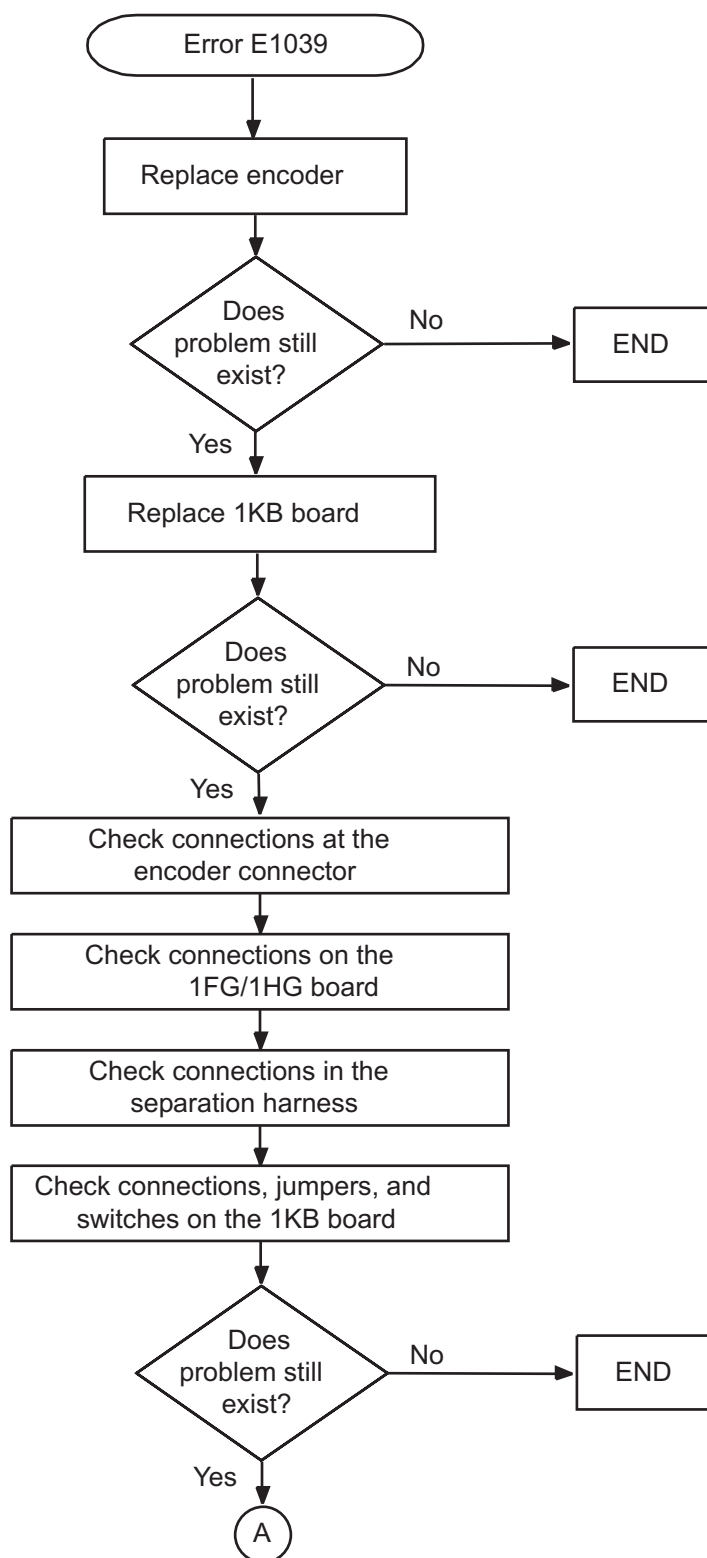
**TROUBLESHOOTING**

Figure 1-19 Error E1039 Flowchart (1)

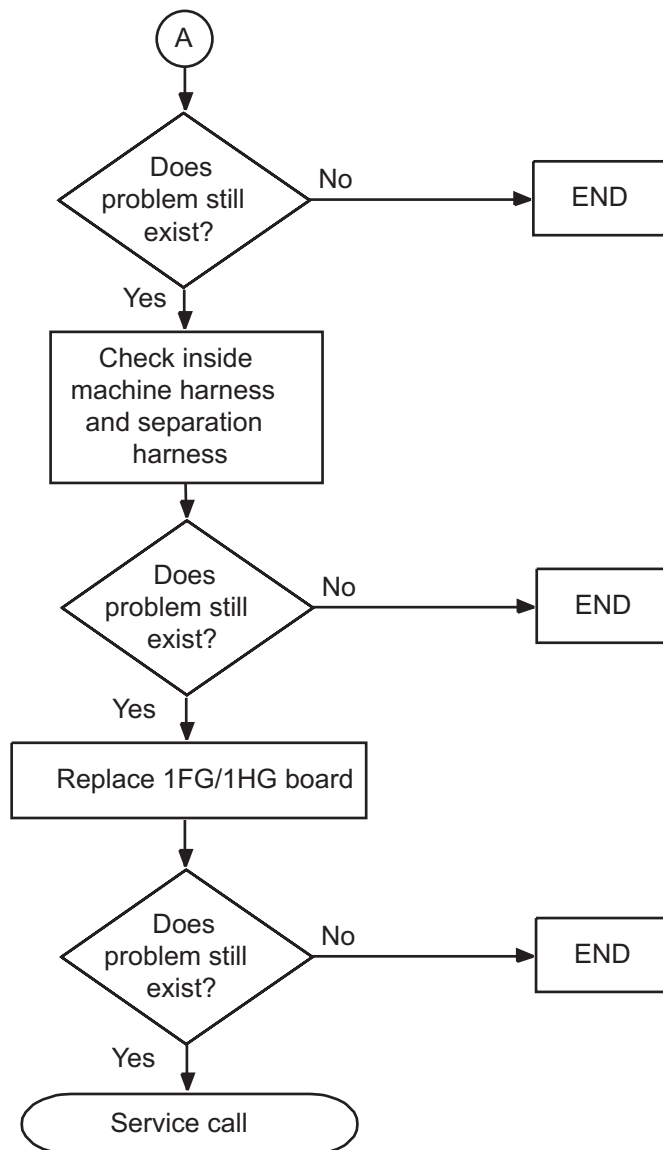
**TROUBLESHOOTING**

Figure 1-20 Error E1039 Flowchart (2)

## 2.0 COMPONENT REPLACEMENT

This chapter describes replacement procedure for parts inside the controller: printed boards, power blocks, hardware including AVR, etc., and, units.

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## 2.1 GENERAL SAFETY PRECAUTIONS ON REPLACEMENT

This section describes the precautions to be taken when replacing parts due to trouble, etc.

This information is presented here for use as general precautions. In addition to these, adhere the safety measures required for each replacement procedure.



### CAUTION

**Parts replacement duties are limited to personnel who have completed special training and education for the installed robot or for an equivalent model.**

1. Read and understand thoroughly all manuals, specifications and related documents provided by Kawasaki before operation.
2. Before entering the safety fence (safeguarded space), make sure all necessary safety measures are prepared and functioning well.
3. Before starting replacement work, shut OFF control power up to the main power source. Display signs indicating clearly “POWER CUT-OFF IN PROGRESS” or “REPLACEMENT IN PROGRESS”, and lock out/tag out the main power switch to prevent personnel from accidentally turning ON the power.
4. Before starting replacement work, secure enough space around the robot so there is no danger of interference with peripheral systems. Set the peripheral systems in a fixed status so they will not make any sudden motion.
5. Disable automatic operation functions when entering the safety fence. If the robot makes any abnormal motion, press **EMERGENCY STOP** switch immediately, and evacuate on a planned path of retreat.
6. In addition to the **EMERGENCY STOP** switch held by the technician, install another **E-STOP** switch for the supervisor outside the safety fence, in a place where the robot’s entire motion range can be monitored. If the robot moves abnormally during observation of the replacement, the **E-STOP** switch should be accessible and easy for the supervisor to press. After an E-Stop, reset and restart robot operations from outside the fence. Moreover, monitoring duties are limited to personnel who are trained and qualified.

7. Use only Kawasaki approved parts during replacement.
8. When replacing printed boards, do not fail to turn OFF control power. To replace power block, MC unit, or AVR, wait at least seven minutes after control power OFF before removing connectors. Then confirm that output voltage from the DC power source and the P-N voltage are 0V.
9. During operation, both technician and supervisor must always watch out for abnormal motion and possible pinch points in and around the robot.
10. Semiconductors are often used in printed boards. Note that these semiconductors are sensitive to static electricity, be sure to discharge any electrostatic on the body before handling the printed boards.
11. Directly touching the parts containing semiconductors may cause electrostatic discharge damage. When handling printed boards, do not touch the semiconductors directly but hold the periphery of the printed boards. If parts must be touched directly, confirm that electrostatic on the body has been discharged.
12. Putting printed boards directly onto the controller, etc. may cause electrostatic discharge damage. Be sure to put them on an electrostatic-proof mat board or sheet, or enclose printed boards in an electrostatic-proof bag.
13. Avoid removing printed boards at control power ON, or turning the control power ON without any printed boards mounted.
14. Take a record of all data settings currently on controller, printed boards, etc. so the system can be restored to its normal operating condition.
15. To prevent displacement of the robot, take a record of the robot's pose before starting the replacement procedure.
16. Be sure to connect connectors and cables correctly. When using connectors equipped with locks, do not fail to lock after insertion. Do not touch connector pins.
17. Immediately after robot movement, the heat sink, the regenerative resistor, etc. may be very hot. Do not touch the power block unit directly, there is a danger of burn.

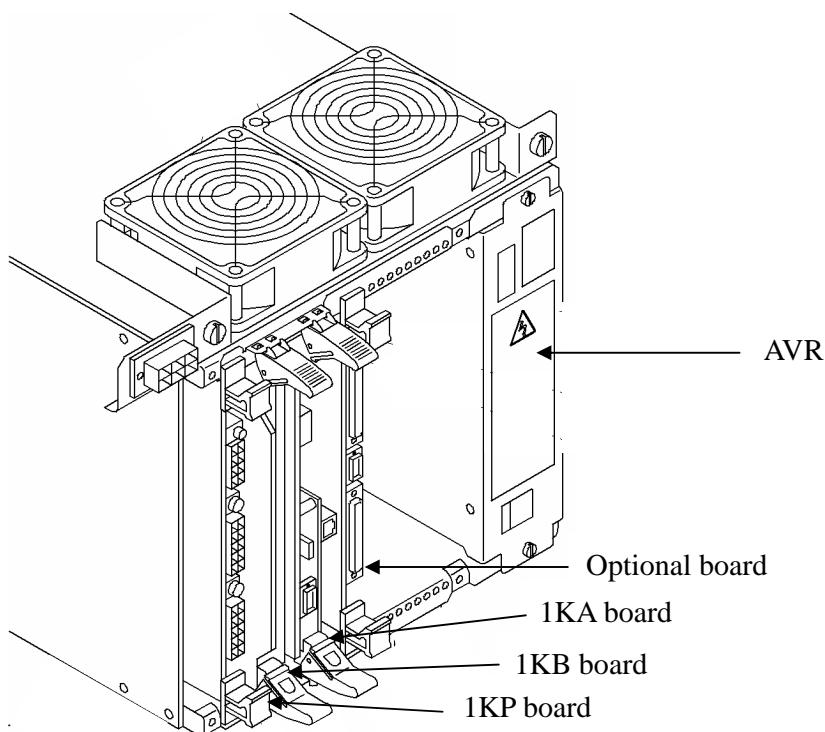


18. Printed boards and power blocks are designed differently for each robot model. Be sure to replace the correct type.
19. When air or water is supplied, shut OFF the supply source and purge any remaining pressure from the lines before starting any replacement procedure.
20. Use lighting of 1500 lux or more to avoid mistakes when reading data or replacing defective parts.
21. After completion of replacement, confirm that the controller functions with no abnormality.

## 2.2 REPLACEMENT PROCEDURE FOR PARTS IN CARD RACK

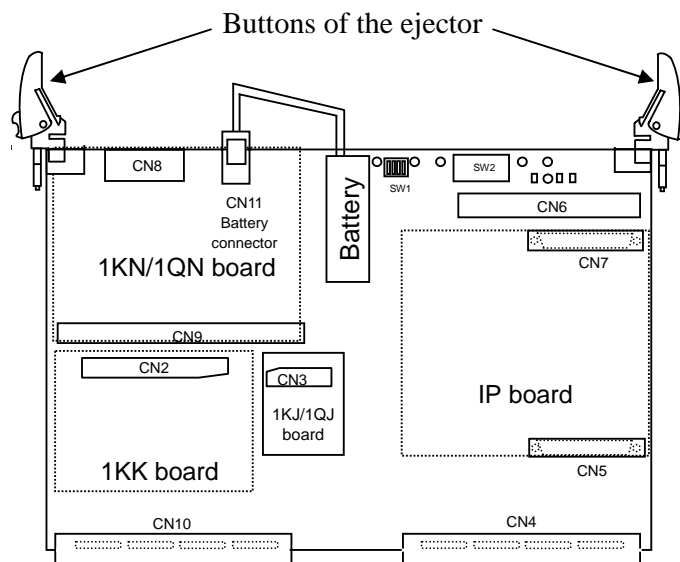
In the card rack of D3x controller, the 1KP board (power sequence board), 1KB board (arm control board), 1KA board (user I/F board), optional board, and the AVR are housed from the left as shown below. For D7x controller, the 1NR board (brake control board) is housed in the leftmost of the card rack.

This section describes the replacement procedure for the parts inside the card rack.



### **2.2.1 1KA BOARD (USER I/F BOARD)**

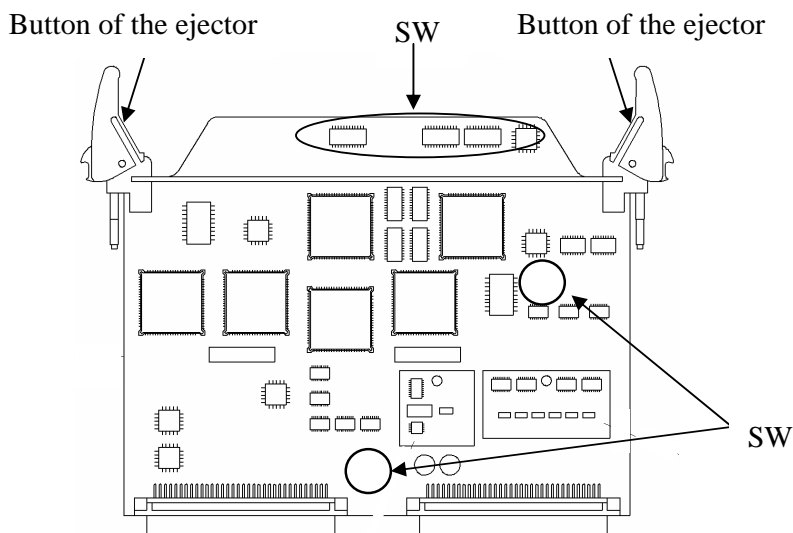
1. This is the user I/F board used for storing taught pose data, user program data, etc. in memory. Before replacing the board, be sure to save all data to storage media such as PCCARD, FDD, etc. For more details about data saving procedures, refer to the Operation Manual, a separate volume.
2. After completion of data saving, turn OFF the control power.
3. Press the red button on the ejector of the 1KA board to release the lock, and pull out the 1KA from the card rack by extending the ejector up and down.
4. When replacing only the 1KA, disassemble daughter boards, 1KK, 1KN/1QN and 1KJ/1QJ, by removing their connecting screws to the 1KA and then the daughter boards.
5. Confirm that settings for SW1 and SW2 on the new 1KA are the same as before board replacement. For the daughter boards disassembled in step 4, reassemble them to the new 1KA.
6. Insert the new 1KA to the card rack and set it in the mother board.
7. Turn ON the SW2-8 on the 1KA.
8. Turn ON the control power. When the initialization prompt is displayed on the teach pendant display, select “999: Initialization of all data”.
9. When the confirmation query for initialization is displayed, select “1: YES”.
10. After completion of initialization, load all data saved before board replacement to the 1KA. For more details about data loading procedure, refer to the Operation Manual, a separate volume.
11. Turn OFF the SW2-8 on the 1KA.



Overview of the 1KA board

## 2.2.2 1KB BOARD (ARM CONTROL BOARD)

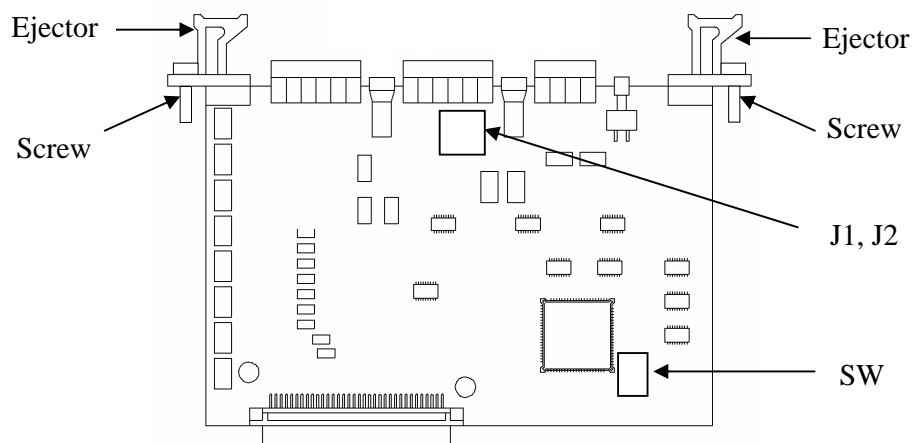
1. Turn OFF the control power.
2. Press the red button on the ejector of the 1KB board to release the lock, and pull out the 1KB from the card rack by extending the ejector up and down.
3. Confirm that settings for SW1 to SW8 and SW10 on the new 1KB are the same as before board replacement. Then, insert the new 1KB to the card rack and set it in the mother board.



Overview of the 1KB board

### 2.2.3 1KP BOARD (POWER SEQUENCE BOARD)

1. Turn OFF the control power.
2. Loosen the screws on top and bottom of the 1KP board, and pull out the 1KP from the card rack by holding the ejectors at both ends of the board. If wired to the front connector, remove the connector first.
3. Confirm that settings for SW, J1 and J2 on the new 1KP are the same as before board replacement. Then, insert the new 1KP to the card rack and set it in the mother board.
4. Fasten the screws on top and bottom of the 1KP.



Overview of the 1KP board

### 2.2.4 AVR

1. Turn OFF the control power.
2. Remove the connectors connected to the AVR.
3. Loosen the two screws fixing the AVR, and remove the AVR.
4. Insert the new AVR to the card rack, and fasten it with the two screws.
5. Restore the connectors removed in step 2 and turn ON the control power.

6. Confirm the voltage at each check pin on the 1KA and 1KP as shown below.

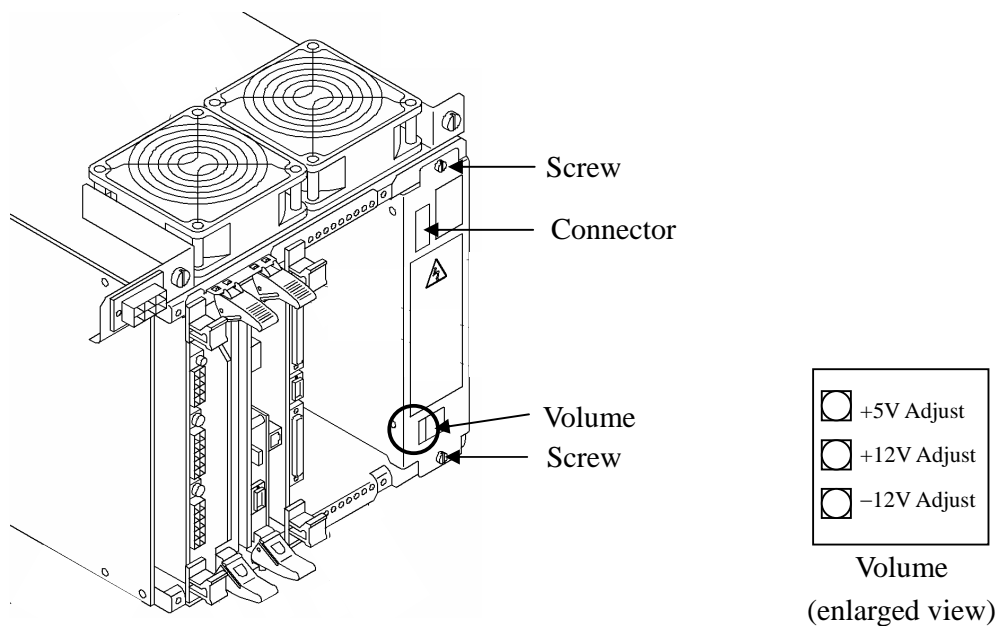
#### 1KA board

No.	Color	Standard	Allowable range	If the voltage is out of allowable range,
TP2	Yellow	-12.0 V	-11.95 V ~ -12.05 V	Adjust the volume on the AVR.
TP3	Yellow	+12.0 V	+11.95 V ~ +12.05 V	Adjust the volume on the AVR.
TP4	Yellow	+5.0 V	+4.95 V ~ +5.05 V	Adjust the volume on the AVR.
TP6	Yellow	+3.3 V	+3.16 V ~ +3.44 V	Replace the 1KA.

#### 1KP board

No.	Color	Standard	Allowable range	If the voltage is out of allowable range,
TP1	White	+24.0 V	+23.9 V ~ +24.7 V	Replace the AVR.

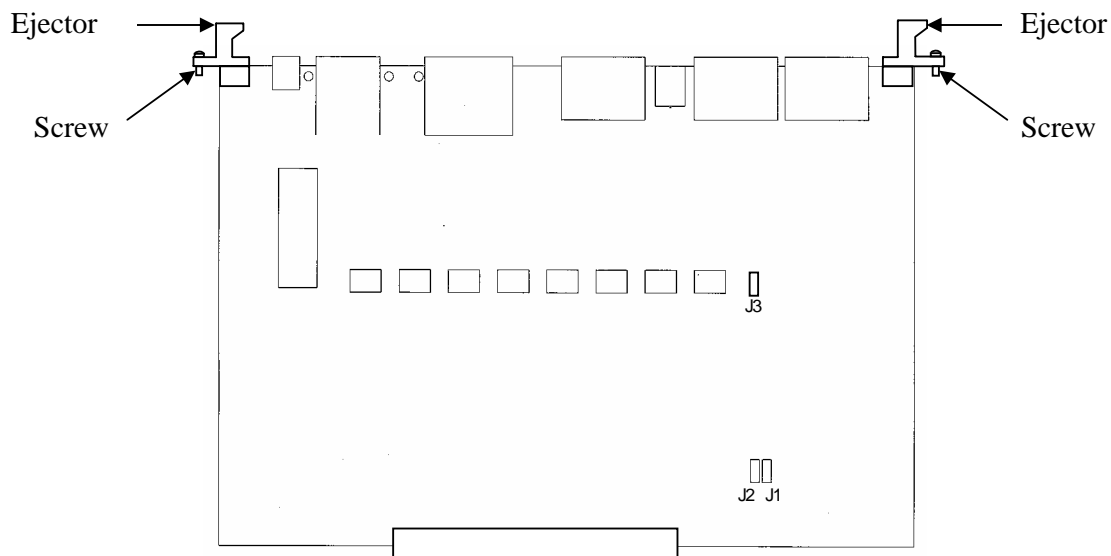
7. If there is no abnormality in the controller after checking voltage, paint lock each adjust volume of the AVR.



Overview of the AVR

### 2.2.5 1NR BOARD (BRAKE CONTROL BOARD)

1. Turn OFF the control power.
2. Loosen the screws on top and bottom of the 1NR board, and pull out the 1NR from the card rack by holding the ejectors at both ends of the board. If wired to the front connector, remove the connector first.
3. Confirm that settings for J1, J2 and J3 on the new 1NR are the same as before board replacement. Then, insert the new 1NR to the card rack and set it in the mother board.
4. Fasten the screws on top and bottom of the 1NR.



Overview of the 1NR board

## 2.3 REPLACEMENT PROCEDURE FOR POWER BLOCK UNIT

This section describes the replacement procedure for the power block unit mounted in the controller.

Four types of power block are available as described below.

1. 1KC: Power block for large robot (six axes)
2. 1KD: Power block for small robot (six axes)
3. 1KL: Optional power block for large motor (single axis)
4. 1KR: Optional power block for small motor (single axis)

Replacement procedures for the 1KC and 1KD are described in this section.



### **DANGER**

**High voltage is applied in the power block unit. Do not touch any connector pin during replacement.**

### 2.3.1 1KC POWER BLOCK UNIT



### **DANGER**

**Before starting replacement work, turn OFF the control power and wait at least seven minutes.**



### **WARNING**

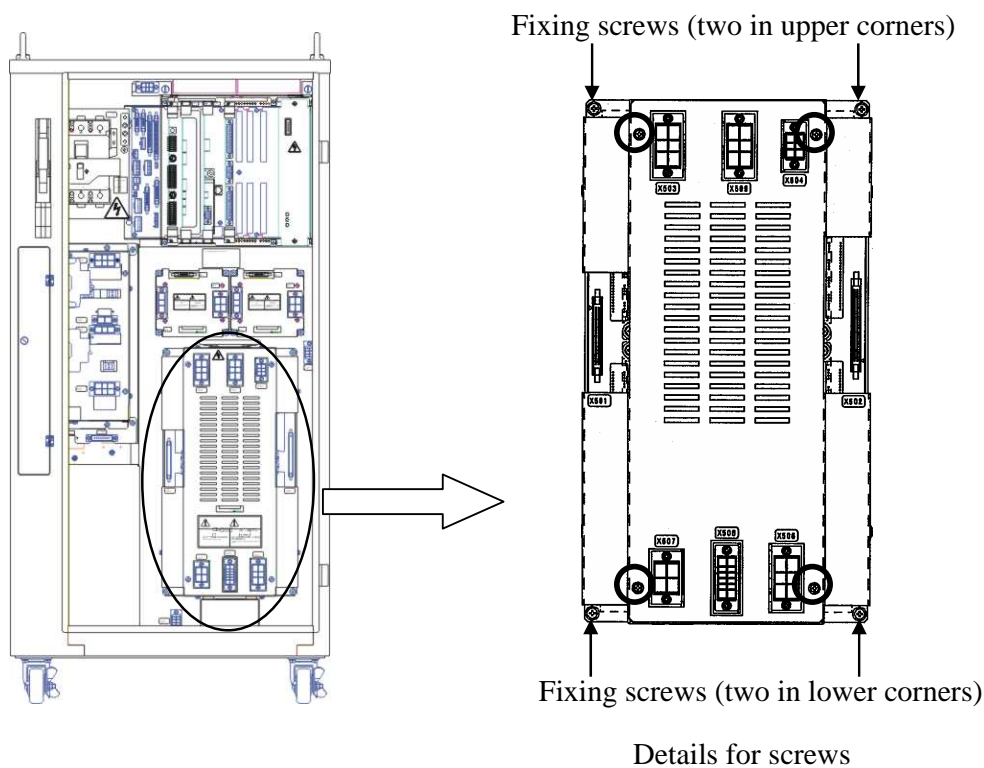
**Do not remove the screws or cover from the front of the power block unit. This is a high voltage area and there is a danger of electric shock.**



### **CAUTION**

**Power block unit weighs approx. 20kg. Be careful not to incur back injury, etc. when removing the power block unit.**

1. Remove all connectors connected to the power block unit.
2. Loosen the four screws fixing the power block unit to the controller so that the power block unit can be removed from the controller. (These screws are not removed from the power block unit.)
3. To remove the power block unit, pull it out by sliding on the fulcrum. To be safe, hold the handle on top with one hand.
4. Place the new unit on the fulcrum, and set it in by holding the handle on top with one hand. Then, attach it to the controller by fastening the four screws correctly.
5. Restore the connectors removed in step 1.



○: Screws on the front of power block unit  
(Do not touch any of these screws.)

### 2.3.2 1KD POWER BLOCK UNIT (FOR D3X CONTROLLER)

The replacement procedure for the 1KD is same as that for the 1KC. However, the external view of the power block unit is different between the 1KC and the 1KD.



### 2.3.3 1KD POWER BLOCK UNIT (FOR D7X CONTROLLER)

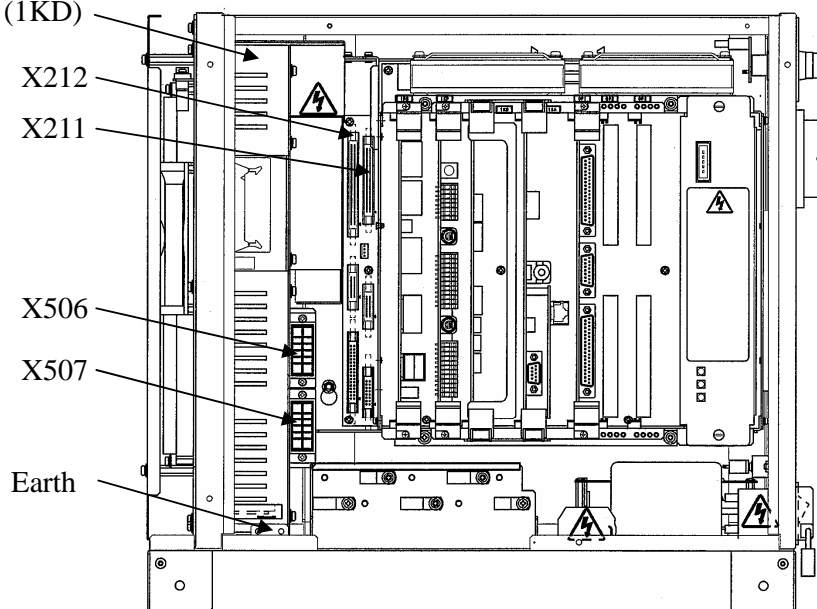


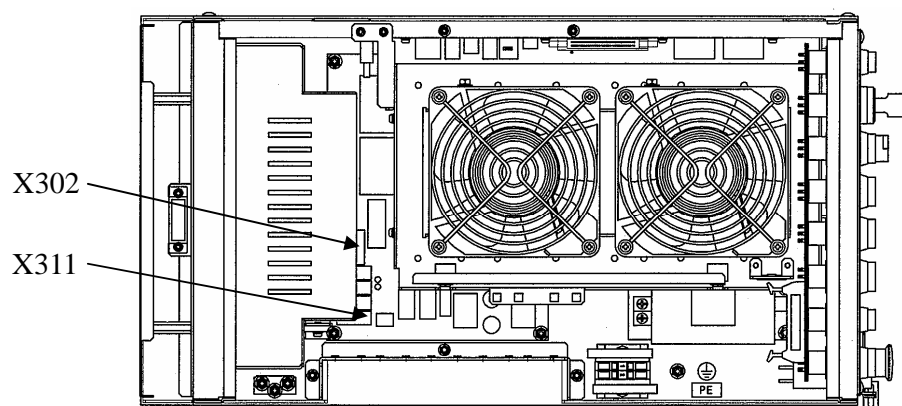
#### **DANGER**

**Before starting replacement work, turn OFF the control power and wait at least seven minutes.**

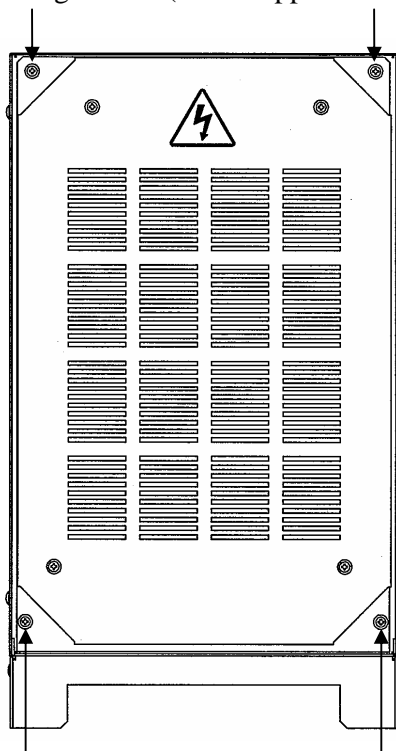
1. Remove the controller cover.
2. Remove the connectors X506 and X507 connected to the power block unit.
3. Remove the screw fixing the earth wired from the power block unit.
4. Remove the four screws fixing the power block unit to the controller.
5. Pull out the power block unit by sliding backward on the fulcrum.
6. Remove the connectors X302 and X311.
7. Remove the connectors X211 and X212.
8. Remove the power block unit.
9. Attach the new unit to the controller in reverse order of removal.

Power block unit (1KD)





Fixing screws (two in upper corners)



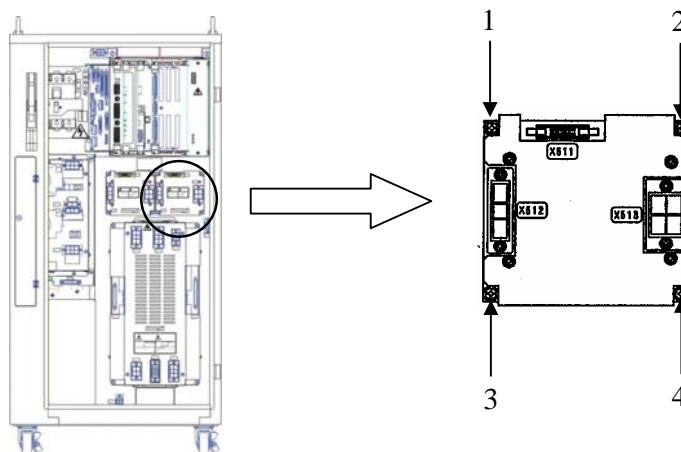
Fixing screws (two in lower corners)

### 2.3.4 1KL POWER BLOCK UNIT

**DANGER**

**Before starting replacement work, turn OFF the control power and wait at least seven minutes.**

1. Remove all connectors connected to the power block unit.
2. Loosen the four screws fixing the power block unit to the controller (1 to 4 in figure below) so that the power block unit can be removed from the controller. (These screws are not removed from the power block unit.)
3. Remove the power block unit.
4. Attach the new unit to the controller by fastening the four screws removed in step 2 correctly.
5. Restore the connectors removed in step 1.



### 2.3.5 1KR POWER BLOCK UNIT

The replacement procedure for the 1KR is same as that for the 1KL.

## 2.4 REPLACEMENT PROCEDURE FOR MC UNIT PARTS (FOR D3X CONTROLLER)

This section describes the replacement procedure for the MC unit (power supply unit) and the 1KQ board (power circuit board) which flanks the MC unit.

### 2.4.1 MC UNIT



#### DANGER

**Before starting replacement work, turn OFF the control power and wait at least seven minutes.**

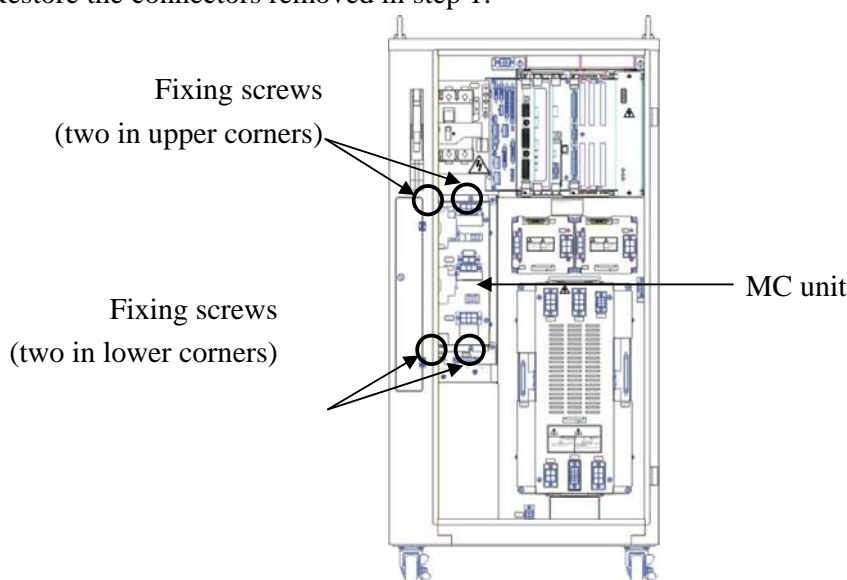
1. To facilitate the replacement process, remove all connectors and power block connectors connected to the MC unit.
2. Loosen the four screws fixing the MC unit to the controller, then remove the MC unit from the controller.\* (See figure below.)

**NOTE\*** Fully removing the screws may cause the MC unit to drop, or make the restoration process unnecessarily difficult. Be sure to leave the screws on the controller side.

3. Attach the new MC unit to the controller, and fasten it with the four screws.\*\*

**NOTE\*\*** Be careful not to let the washers/screws fall under the MC unit.

4. Restore the connectors removed in step 1.




**CAUTION**

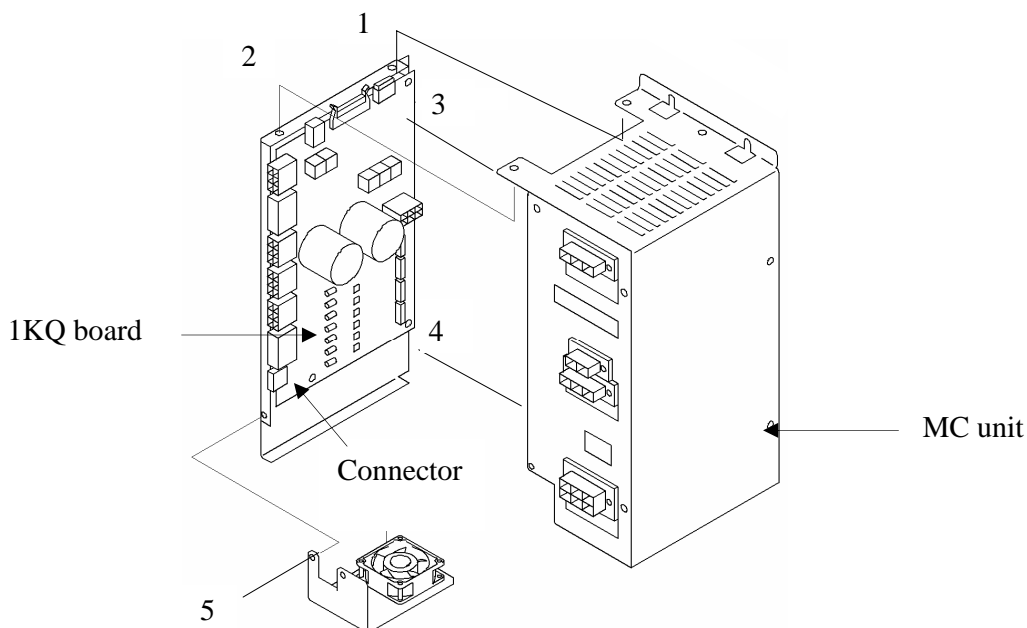
MC unit weighs approx. 6kg. Be careful not to cut or squeeze the tips of your fingers when replacing MC unit.

## 2.4.2 1KQ BOARD (POWER CIRCUIT BOARD)


**DANGER**

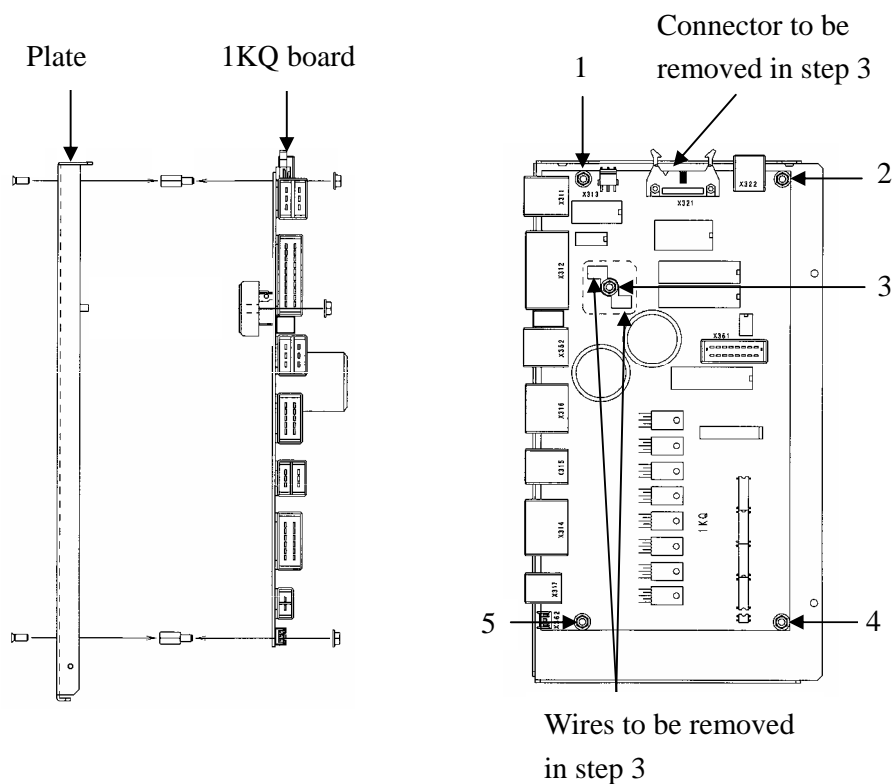
Before starting replacement work, turn OFF the control power and wait at least seven minutes.

1. Remove the MC unit. For details, refer to 2.4.1 MC Unit.
2. Remove the four screws fixing the 1KQ board assy to the MC unit (1 to 4 in figure below), the one screw fixing the fan unit of the MC unit (5 in figure below), and the connector for the fan. Then, pull out the 1KQ board assy.



3. Remove the connector and the two wires of the 1KQ, then remove the 1KQ board assy from the MC unit.

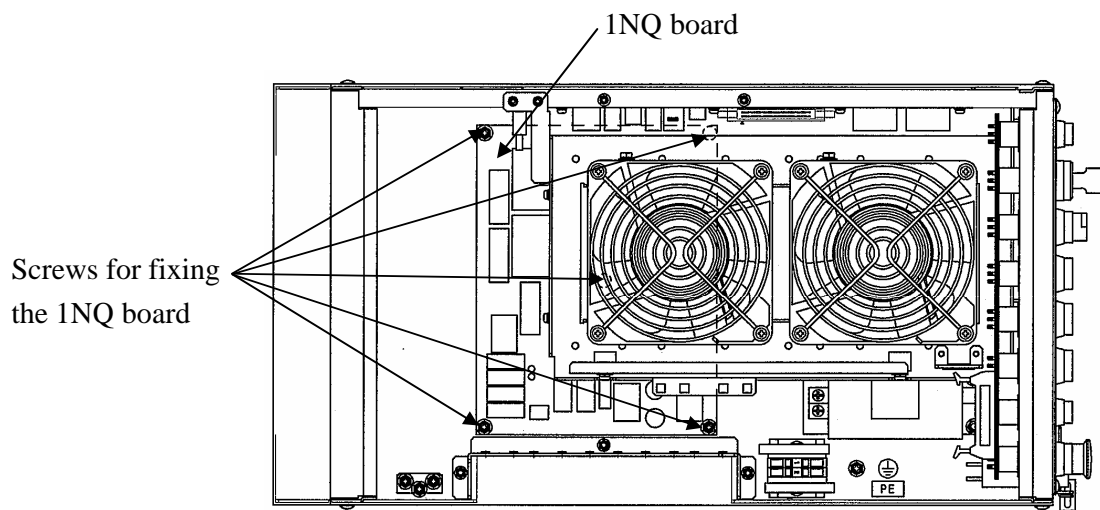
4. Loosen the five nuts fixing the 1KQ to the plate (1 to 5 in figure below), and remove the 1KQ.
5. Attach the new 1KQ to the plate with the five nuts removed in step 4.
6. Restore the connector and two wires removed in step 3 to the assy assembled in step 5.
7. Refasten the screws and connect the connector removed in step 2.
8. Attach the MC unit to the controller. For details, refer to 2.4.1 MC Unit.



## 2.5 REPLACEMENT PROCEDURE FOR 1NQ BOARD (FOR D7X CONTROLLER)

This section describes the replacement procedure for the 1NQ board (power circuit board)

1. Turn OFF the control power.
2. Remove the power block unit. (For the procedure, see 2.3.3 1KD Power Block Unit (for D7x Controller).)
3. Remove the 1NR, 1KP, 1KB, and 1KA boards in the card rack.
4. Remove all connectors connected to the 1NQ board.
5. Remove the five screws fixing the 1NQ board.
6. Remove the 1NQ board from back side.
7. Attach the new 1NQ board by fastening the five screws.
8. Restore the connectors removed in step 4.
9. Restore the boards removed in step 3.
10. Restore the power block unit to the controller.

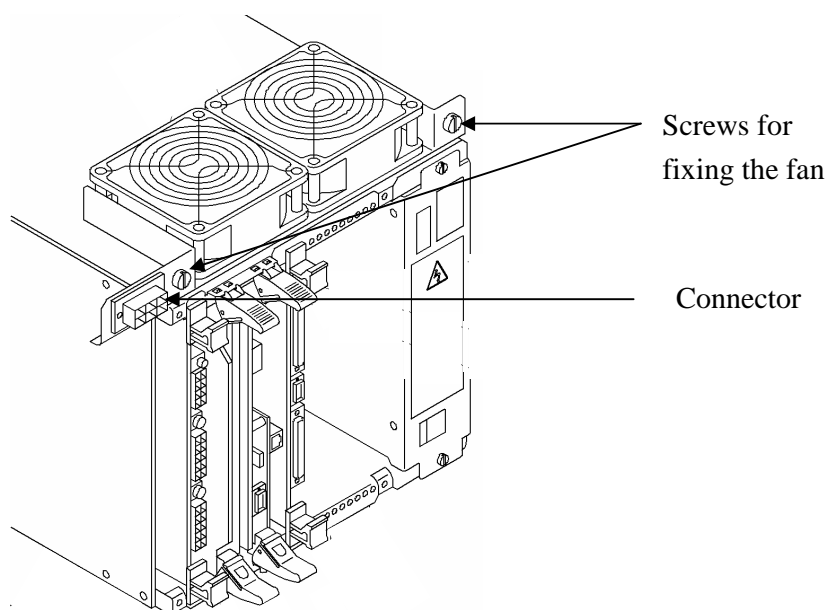


## 2.6 REPLACEMENT PROCEDURE FOR FAN (FOR D3X CONTROLLER)

Fans are installed for the card rack, the power block unit, and the MC unit. This section describes the replacement procedure for these fans.

### 2.6.1 FAN FOR CARD RACK

1. Turn OFF the control power.
2. Remove the connector connecting the fan to the card rack. Then, loosen and remove the two screws fixing the fan unit.
3. Remove the power line and the earth wire connected to the fan. Loosen the four screws fixing the fan, and then remove the fan.
4. Attach the new fan with the four screws, and restore the power line and earth wire removed in step 3. Be sure to reattach the fan correctly; wind blows top to down.
5. Attach the fan unit to the top of the card rack, and fasten it with the two screws.
6. Restore the connector removed in step 2.



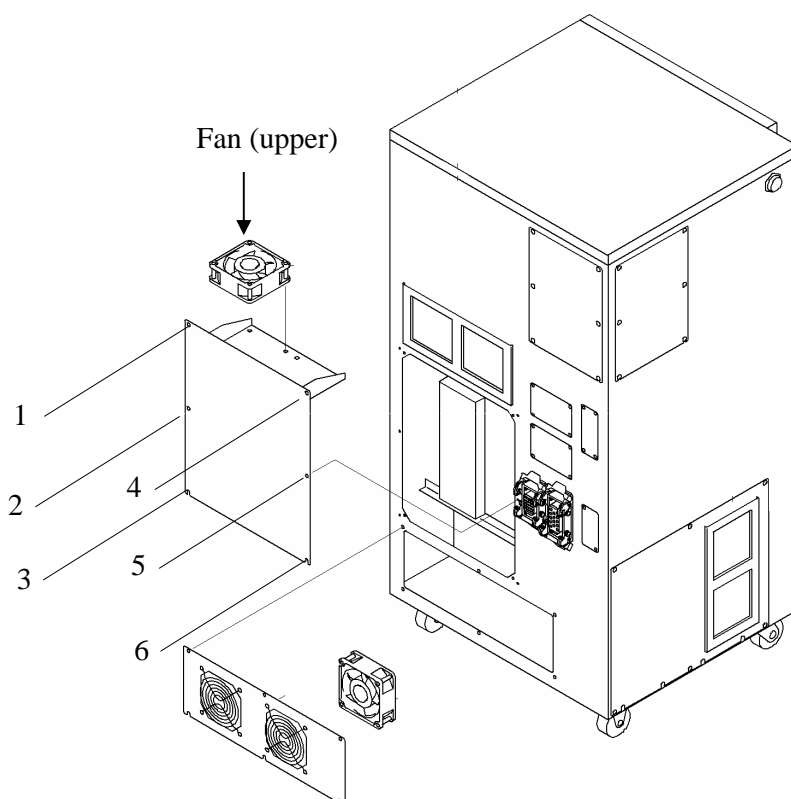


## 2.6.2 FANS ON THE BACK OF CONTROLLER

This section describes the replacement procedures for the two fans mounted on the controller back. The upper fan cannot be seen from outside.

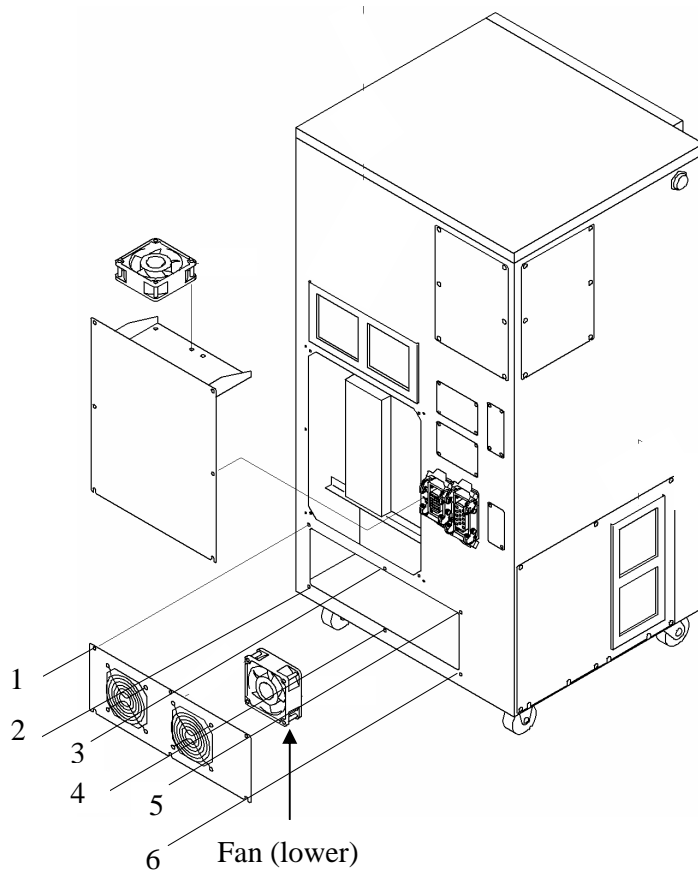
### 2.6.2.1 UPPER FAN ON BACK OF CONTROLLER

1. Turn OFF the control power.
2. Remove the six screws fixing the plate on the controller back (1 to 6 in figure below).
3. Pull out the plate, remove the connector connected to the controller, then remove the plate.
4. Remove the power line and the earth wire connected to the fan. Loosen and remove the four screws fixing the fan, and then remove the fan.
5. Attach the new fan to the plate with the four screws, and restore the power line and earth wire removed in step 4. Be sure to reattach the fan correctly; wind blows top to down.
6. Restore the connector removed in step 3, and reattach the plate with the six screws.



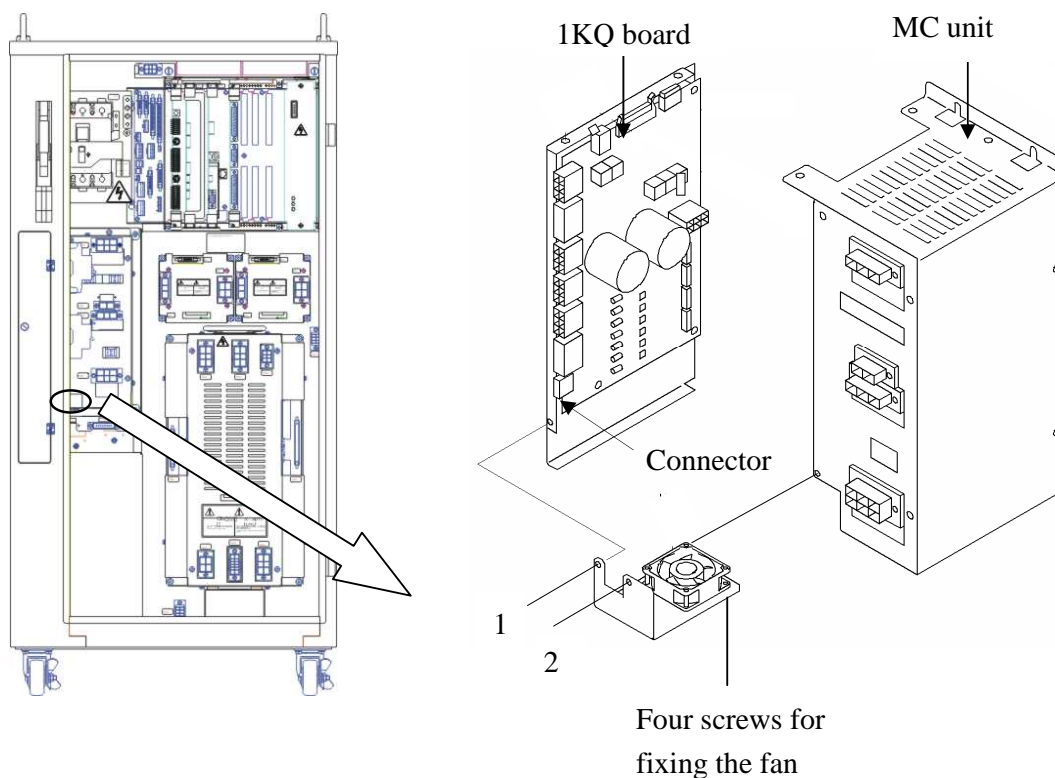
### 2.6.2.2 LOWER FAN ON BACK OF CONTROLLER

1. Turn OFF the control power.
2. Remove the six screws fixing the plate on the controller back.
3. Pull out the plate, remove the connector connected to the controller, and remove the plate.
4. Remove the power line and the earth wire connected to the fan. Loosen and remove the four screws fixing the fan, and then remove the fan.
5. Attach the new fan to the plate with the four screws, and restore the power line and earth wire removed in step 4. Be sure to reattach the fan correctly; wind blows from inside to outside.
6. Restore the connector removed in step 3, and reattach the plate to the controller with the six screws.



### 2.6.3 MC UNIT FAN

1. Turn OFF the control power.
2. Remove the two screws at the bottom of the MC unit (1 and 2 in figure below) and pull out the plate. Remove the connector connected to the 1KQ board and remove the fan unit.
3. Remove the four screws fixing the fan and remove the fan.
4. Attach the new fan to the plate with the four screws. Be sure to reattach the fan correctly; wind blows top to down.
5. Restore the connector removed in step 2, and attach the plate to the MC unit with the two screws.

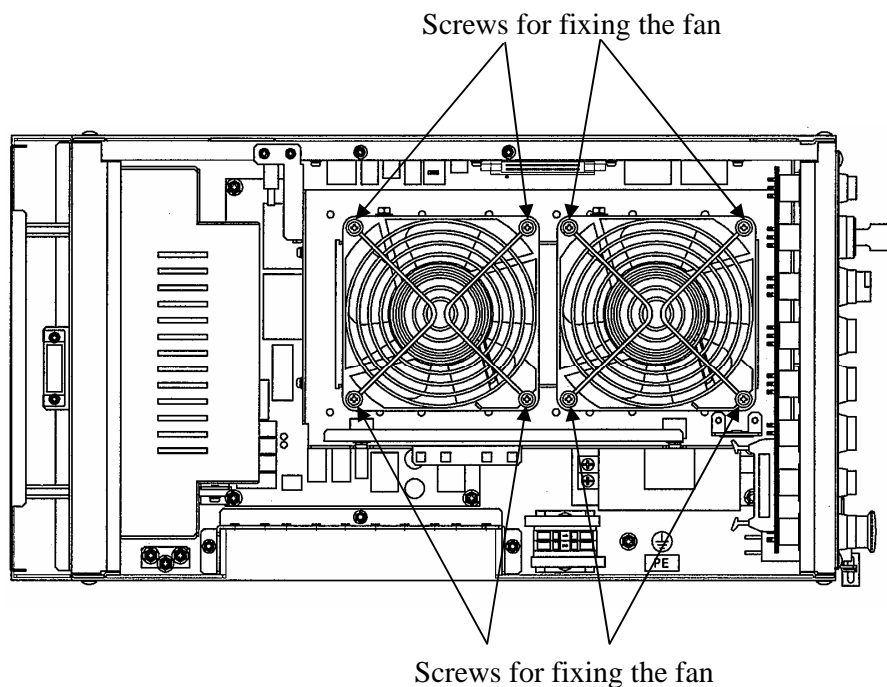


## 2.7 REPLACEMENT PROCEDURE FOR FAN (FOR D7X CONTROLLER)

Fans are installed for the card rack, the power block unit, and the cover (only for D71/74/77 controller). This section describes the replacement procedure for these fans.

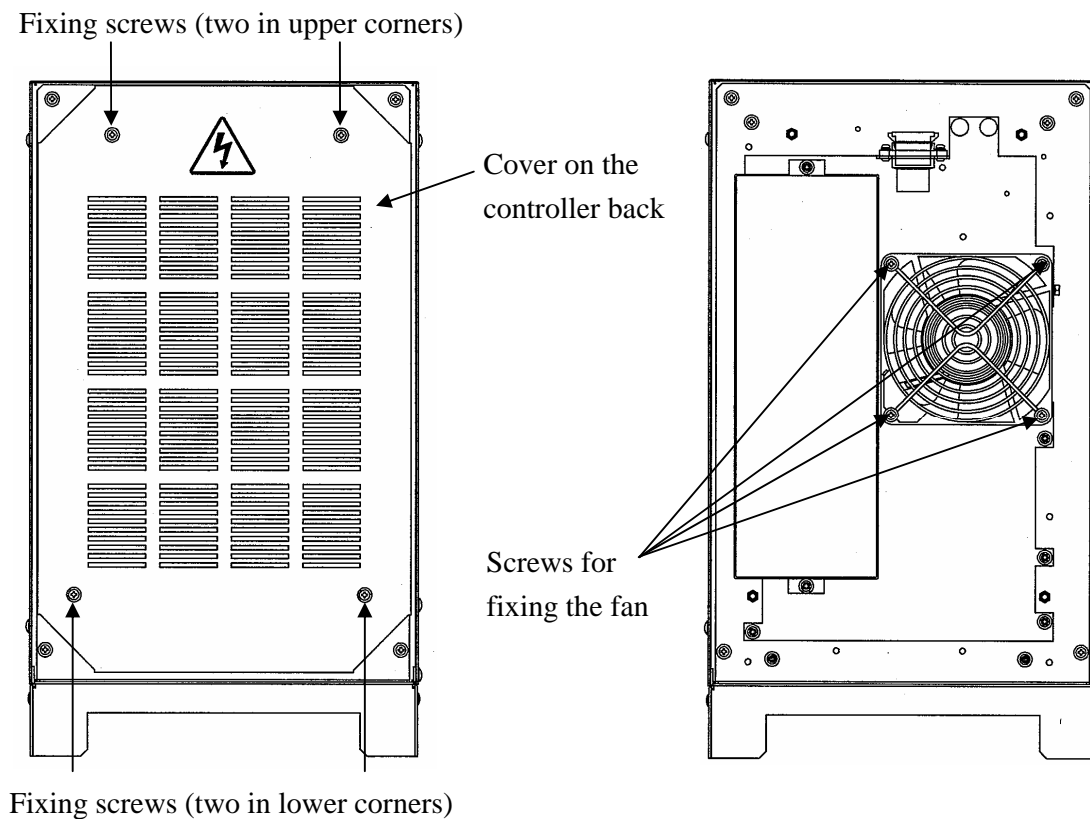
### 2.7.1 FAN FOR CARD RACK

1. Turn OFF the control power.
2. Open the controller cover.
3. Remove the four screws fixing the fan.
4. Remove the power line and the earth wire connected to the fan, and then remove the fan.
5. Restore the power line and earth wire removed in step 4 to the new fan.
6. Fix the fan with the four screws. Be sure to reattach the fan correctly; wind blows top to down.



### 2.7.2 FAN FOR POWER BLOCK UNIT

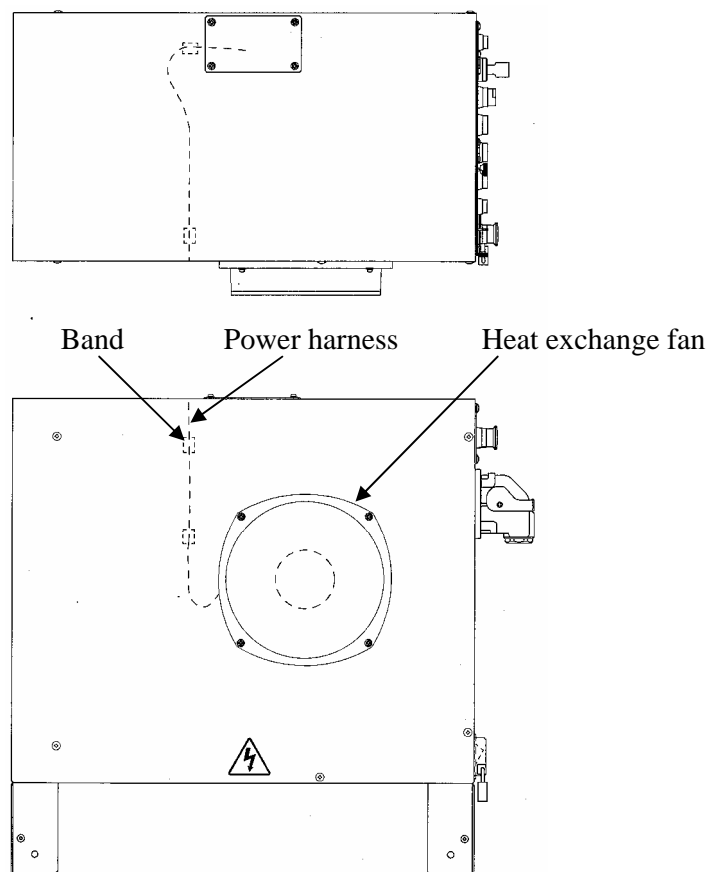
1. Turn OFF the control power.
2. Remove the four screws fixing the cover on the controller back, and then remove the cover.
3. Remove the four screws fixing the fan.
4. Remove the power line and the earth wire connected to the fan, and then remove the fan.
5. Restore the power line and earth wire removed in step 4 to the new fan.
6. Fix the fan with the four screws. Be sure to reattach the fan correctly; wind blows from outside to inside.
7. Restore the cover on the controller back with the four screw.



### 2.7.3 HEAT EXCHANGE FAN (FOR D71/74/77 CONTROLLER)

Heat exchange fan is installed on the left side of the controller cover.

1. Turn OFF the control power.
2. Remove the controller cover.
3. Remove the power harness from the bands which fix the harness.
4. Remove the four screws fixing the fan, and then remove the fan.
5. Attach the new fan with the four screws. Be sure to reattach the fan correctly.
6. Restore the power harness removed in step 3 with the bands.
7. Restore the controller cover.



## 2.8 REPLACEMENT PROCEDURE FOR BATTERIES

This section describes the replacement procedure for the battery provided to backup data.

### 2.8.1 BATTERY ON 1KA BOARD

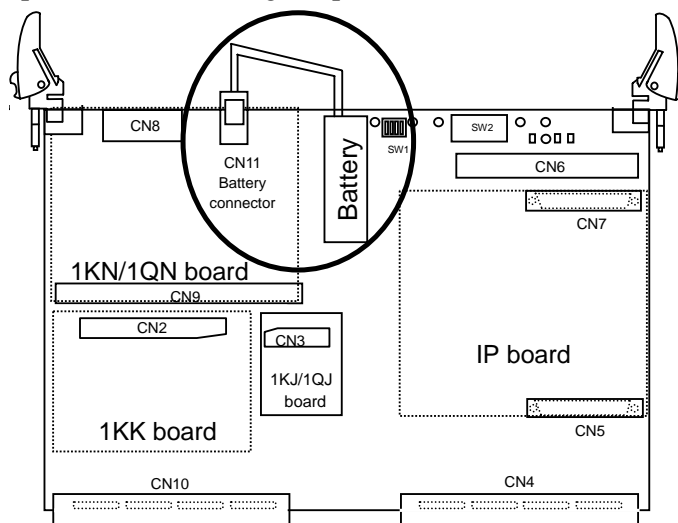
As backup power supply for SRAM and RTC (Real Time Clock), the 1KA board is equipped with a lithium battery and an emergency super capacitor for use during battery replacement.

When on-board battery is removed, fully charged super capacitor can provide backup power for only 15 minutes. Therefore, battery should be replaced immediately once the control power is cut OFF.

**⚠ CAUTION**

**To prevent data erasion, be sure to save program data as soon as it is completed.**

1. Before replacing the battery, confirm that the new battery has +3.6V or more voltage.
2. Turn OFF the control power.
3. Remove the battery connector of the 1KA and pull out the battery from the holder. When it is hard to work on, pull out the 1KA. For more details about pulling out the board, refer to 2.2.1 1KA Board (User I/F Board).
4. After installing the new battery to the holder, connect the battery connector. If the 1KA was pulled out, put it back to the original place.



## 2.8.2 BATTERY ON 1FG/1HG BOARD

1. Record the encoder value for all axes before replacing a battery.
2. Before replacing the battery, confirm that the new battery has +3.6V or more voltage.
3. Turn OFF the control power.
4. For the 1HG board, pull out the connector box located on the base of the robot main body.  
For the 1FG board, remove the plate that is installed with a battery.
5. Remove the battery connector (CN10 for 1FG, CN4 for 1HG), cut two bands fixing the battery, and remove the battery.
6. Fix the new battery with two bands, and restore the connector removed in step 4.
7. For the 1HG, restore the connector box. For the 1FG, restore the plate that is installed with a battery.
8. Reinstall the cover on the robot arm. Turn ON the control power and check if the encoder value has changed.



### CAUTION

1. Battery life is about year and a half (assuming control power is OFF continuously), but longevity differs depending on ambient temperature, etc.
2. The encoder assembly contains a super capacitor that maintains memory power for approximately 30 minutes. In order to maintain encoder data when replacing the 1FG batteries or disconnecting the encoder from the 1FG board, the batteries must be replaced or the encoder reconnected within the 30 minutes period. (Take note that if the super capacitor is not fully charged, encoder data may not be maintained for the full 30 minutes.)



## 2.9 REPLACEMENT PROCEDURE FOR FUSES

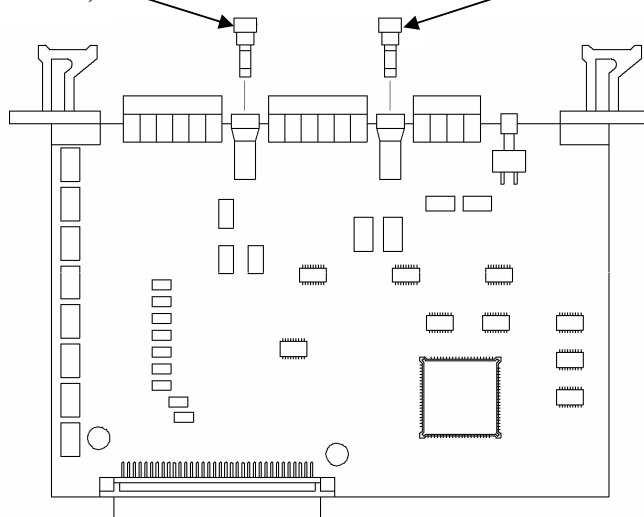
This section describes the replacement procedure for the fuses.

### 2.9.1 FUSES ON 1KP BOARD

Two types of fuses- Fuse1 and Fuse2- are mounted on the 1KP board.

1. Turn OFF the control power.
2. Push the fuse on the front of the board and turn it 90 degrees to the left. Then pull it out and remove the fuse from the board.
3. Push in the new fuse, and turn it 90 degrees to the right to install.

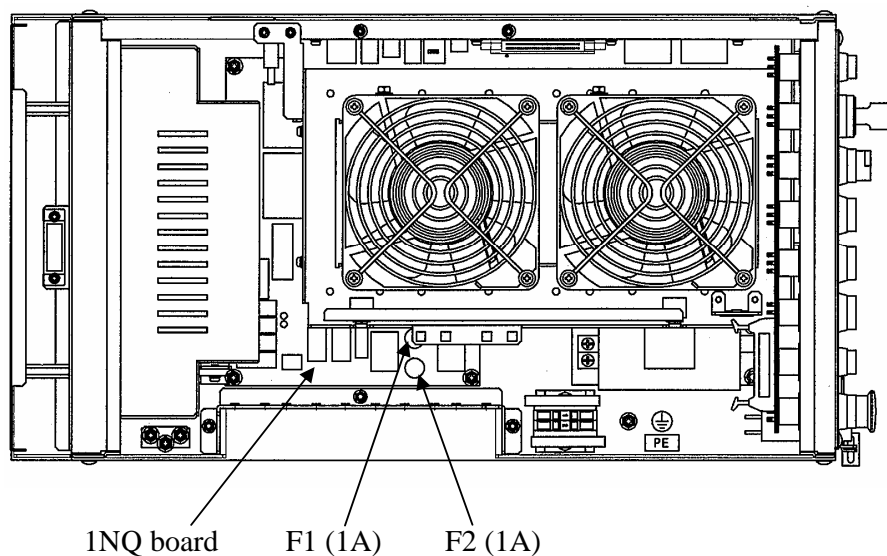
Fuse2 (Machine valves: 1A)      Fuse1 (E-Stop: 315 mA)



Overview of the 1KP board

### 2.9.2 FUSES ON 1NQ BOARD (FOR D7X CONTROLLER)

1. Turn OFF the control power.
2. Remove the controller cover.
3. Turn the fuse 90 degrees to the left. Then pull it out and remove the fuse from the board.
4. Push in the new fuse, and turn it 90 degrees to the right to install.
5. Restore the controller cover.



## 2.10 REPLACEMENT PROCEDURE FOR FILTER

Wash filters periodically to keep them clean. For replacement, follow the replacement procedure described below.

Filters are located on the side and back of the controller. Take the same procedure to replace these filters.

1. In the center, bottom of the holder for the filter there is a notch. Insert something tube shaped into the notch, and push up the filter. Be careful not to damage the controller face.
2. Pull up the raised filter.
3. Insert the replacement filter into the holder.

